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MEDICAL REPORT OF THE

SOCIETY OF THE LYING-IN HOSPITAL

OF THE CITY OF NEW YORK

INCORPORATED MARCH 1, 1799

NEW YORK
D. APPLETON & COMPANY
1897

Press of J. J. Little & Co.
Astor Place, New York

PREFACE

In presenting the following Report, the Medical Board wishes again to call attention to the fact that this Hospital is an institution the purpose of which is to teach obstetrics quite as much as to conduct a work of charity.

It has, therefore, seemed proper to describe at some length the methods of instruction in use at the Hospital, and also the system of taking histories and recording statistics.

The clinical basis of this Report is derived entirely from the outdoor service of the Hospital.

Following the articles on methods of instruction is a statistical synopsis which covers a period of six years, from the beginning of the present system in the Midwifery Dispensary at 314 Broome Street, to April 1, 1896.

This statistical synopsis includes the figures in the two Reports of the Midwifery Dispensary issued in 1891 and 1892, and also the figures of a similar synopsis published by this Society in a medical report in 1893.

There are also presented here articles based upon the cases in the service of the Hospital, by members of the Medical Board.

In addition, articles have been contributed by the heads of the special departments, and by the assistant attending physicians.

Regarding the articles contributed by officers who are not members of the Medical Board, it may be said that the opinions therein stated are the opinions of the individual writers, and are not necessarily endorsed by the Medical Board. Such articles have been more or less carefully supervised, but there has been no attempt to influence or restrain the opinions of the authors.

It will be noted that there is no report from the Ophthalmologist, the Neurologist, or the Dermatologist. This is due to the fact that the material at present collected does not warrant a report from those departments.

In anticipation of an obvious criticism that many subjects of interest which must have been found in so large a series of cases have not been reported, the Board wishes to say that these subjects have been reserved for a future Report.

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Vice-President.

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T. Halsted Myers, M.D.

Embryologist.
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Neurologist.
C. A. Herter, M.D.

Pathologist.
Farquhar Ferguson, M.D.

Ophthalmologist.
J. L. Adams, M.D.

Bacteriologist.
Martha Wollstein, M.D.

Dermatologist.
James Johnston, M.D.

Assistant Registrar.
Asa B. Davis, M.D.

Assistant Curator.
Martha Wollstein, M.D.

Chief Clerk.
Charles Ford.

Chief Nurse.
Miss E. Miller.

Assistant Nurse.
Miss Margaret M. McCarthy.

Registrar's Clerk.
Helen F. Nugent.

HOSPITAL.

Second Avenue and Seventeenth Street.

SUB-STATION.

No. 314 Broome Street.

DIET KITCHEN.

No. 314 Broome Street.

MEDICAL REPORT

OF THE

SOCIETY OF THE LYING-IN HOSPITAL

MEDICAL RECORDS AND THE PREPARATION OF STATISTICS.

SYNOPSIS.

I. Introduction.

II. The Nature of the Statistics.
- *a.* Indoor Service.
- *b.* Outdoor Service.
- *c.* The Student Observer.
  1. His Inexperience.
  2. His Enthusiasm.
- *d.* The Checks on the Student.
  1. Fixing Responsibility for Written Records.
  2. Written Reports to Transfer Responsibility from Student to House Staff.
  3. Personal Investigation of Abnormalities by Trained Assistants.—Abnormality Book.
  4. Personal Inspection of the Records at the Bedside by Trained Assistants.
  5. Daily Rotation on the Postpartum Cases.
  6. Time-clock Stamp.

III. The Histories.
- *a.* The Blanks.
  1. Their Development.
  2. The Forms in Present Use.
     - *x.* Medical.
     - *y.* Administrative for Students.
     - *z.* Administrative for Patients.
- *b.* The Writing of the Records.
  1. The Student.
  2. The Assistant Resident Physician.
  3. The Discharge of Patients.
- *c.* The Checks on the Histories.
  1. The Attendance Book.
  2. The Attendance Cards.
  3. The Operation Book.

IV. The Registrar's Office.
a. The Registrar.
1. General Oversight.
2. Annual Statistical Report.
b. The Assistant Registrar.
1. Numbering the Histories.
2. Summarizing the Diagnoses.
c. The Registrar's Clerk.
1. The Large Statistic Book.
x. Special Arrangement.
y. Summarizing Pages.
z. Check on this Book.
2. The Card Index.
x. The Individual Cards.
y. The Checks on the Cards.

V. Conclusion.

I. Introduction.

It is the practice of every hospital to demand of its resident medical staff that a more or less complete medical history be kept of every patient in its wards. These histories are bound in volumes, and are stored away to be referred to, perhaps, by some members of the Medical Board who may desire to investigate a special subject, or to be produced as evidence in a court of law. It is unusual, in this country at least, that any systematic use should be made of the valuable records thus filed away every year. The Johns Hopkins Hospital is the one preëminent exception to this general rule, and the reports of that institution are unsurpassed by any similar reports published in this country or abroad. The first reports recently published from the Children's Hospital in Boston, and the Presbyterian Hospital in New York, must be added to this list.

The Society of the Lying-in Hospital has made three previous publications of this nature, and it is the purpose of this article to present its method of recording its observations and of preparing its statistics for reference and use. There is no new principle involved, but perhaps a knowledge of some working system may be of service to others who may desire to establish a series of reports. The system here developed deals only with obstetrical cases, and it is not complicated, except where it encounters the possible complications of pregnancy, labor, and the puerperal state. The necessary elasticity is given to this part of the system by the use of the card-index system, so generally employed in library catalogues.

II. The Nature of the Statistics.

The obstetrical service of the Society of the Lying-in Hospital furnishes two distinct kinds of statistics: those of the indoor and those of the outdoor service. The indoor service was established in January, 1895, and

consists at present of seventeen beds. The histories are written by the resident medical staff, and are accurate records of the observed facts. This small plant has furnished 411 cases at the present time, October 1, 1896. These histories have been bound in volumes of one hundred, and the statistics have been kept separate from those derived from the outdoor service.

The outdoor service was organized on its present basis, but under another name (see previous Reports) in January, 1890, and has furnished 11,492 cases up to the present date, October 1, 1896. These histories are written by the pupils of the Hospital from observations made by them. The pupils are obtained from various sources: from the ranks of practising physicians, from the undergraduate classes in our Medical Schools, and from the graduates of nurses' training schools. Of these, the medical student forms a very large majority. All the facts demanded by the history blanks of the outdoor service are recorded, with few exceptions, by undergraduate medical students.

This unqualified statement would lead to a very erroneous estimate of the scientific value of these statistics, were there not added to it a detailed account of the various checks employed to make the student do his work in a careful and reliable manner. As to the fitness of the medical student to do such work, it is the opinion of the Medical Board of this Hospital, that, unassisted and unchecked, his inexperience would be an absolute bar to his employment. But we believe, under careful oversight, the medical undergraduate can become an accurate observer and recorder of facts. The inability of medical students to make clinical observations, it is believed by the Medical Board, is due to the faulty system of instruction in our Medical Schools, in which the old theoretical lectures still hold the prominent place to the exclusion of classroom work, and individual, clinical instruction of the student at the bedside.

This Hospital accepts as pupils any student, male or female, who has finished a two years' course of study in any medical school. Many students have received their first clinical experience here, and it must be said that, as a class, they have been most enthusiastic in their desire to learn, and energetic in their work. They have shown a feeling of responsibility toward our patients which has insured the latter a considerate and careful treatment. A perusal of the subsequent articles on the teaching of students will show how we prepare the raw material, and so instruct the student that we may use him in the capacity of combined nurse and midwife.

A further study of the following system of checks upon his work will show the means we employ to keep the student in the straight path of scientific accuracy in spite of his inexperience, or of an exceptional desire of some individual to shirk.

First.—The responsibility of every written record is fixed, by requiring the student to sign his name to the patients' histories, to the records of daily visits, and to every other written chart which the details of the service demand of him.

Second.—The student is required by these charts and blanks to make

written reports, at least every two hours, concerning the condition of all cases of labor while in progress. A final written report of each case delivered is filled out upon his return to the Hospital, and he must make an oral report of all observations when he returns from his daily postpartum visits. In these ways the responsibility for every observation is immediately shifted from the student to the physicians on the house staff.

Third.—Whenever one of these reports indicates the existence of any abnormal or unusual condition, one of the resident staff of physicians is sent to corroborate the unusual occurrence or to investigate the complication. The reports of the house staff upon these visits are written in a book known as the "Abnormality Book." These reports are subsequently copied into the daily record upon the history chart of the patient, by the office clerk on night duty.

Fourth.—The students are visited while they are in attendance at their cases by the assistant physicians of the staff. The records of the cases are inspected by the physicians during these visits, while they are being written, and any errors can be corrected.

Fifth.—The postpartum cases are redistributed among the students every twenty-four hours, in order that each student may have as convenient a route as possible through the tenements. This custom insures also a correction, by a more careful student, of any possible oversight made by a fellow-student on the previous day.

Sixth.—A time-clock stamp is in use in both the central office of the Hospital in Seventeenth Street, and also in the office of the sub-station in Broome Street. These clocks stamp upon the original working blanks of the Hospital the date, hour, and minute of the reception of the calls, orders, departure and return of students to and from cases, etc. In this way an absolutely accurate time record is kept of the Hospital business, and there is insured prompt service and an economical expenditure of time on the part of the student.

III. The Histories.

The blanks used for the recording of the obstetrical histories have been developed from a study of similar charts used in other institutions, and from the personal views of the members of the Medical Board. The Hospital owns two scrap-books: in one is kept a sample of every kind of stationery that has been printed for its own use; in the other, copies of the medical and administrative blanks of other hospitals are collected. From time to time the charts have been revised, and the present form is the result of six years' use and experience. The regular blanks of the indoor and outdoor service are identical, except in size. The indoor history blank is thirteen and one-half inches wide by fourteen and one-half inches long; that of the outdoor service, eleven inches wide by seventeen inches long. The indoor service requires a temperature chart and a blank for bedside notes, which are not used in the outdoor service. The regular blanks are, a single-sheet "Pregnancy" chart, and two

double-sheet charts styled "Labor" and "Child." Special blanks, also, for recording postpartum observations extending over periods longer than ten days, and also for special pathological or operative work, and a special form for cases of albuminuria, are in use in both services. Reproductions of the regular blanks and of the special albuminuria blank are presented below; the others present no features not included in these. It will be noticed that the charts call for a very complete series of observations upon the phenomena of pregnancy, labor, and the puerperium. They may seem unnecessarily full, but it is the opinion of the Medical Board that only by insisting upon such minute observations during the period of instruction can the young physician be taught the necessity of attention to detail; only thus can the habit of careful observation be inculcated, and only thus can the ability to obtain an accurate, comprehensive impression of a patient's condition be acquired. Such a chart serves also as a guide to the student in his outdoor work during the absence of his instructor. The student takes a miniature set of these charts to every case of labor, and notes the required facts at the time of their occurrence. These records are subsequently copied upon the full-sized blanks.

PREGNANCY.—OUT-DOOR SERVICE.

CONFINEMENT No..... APPLICATION No.....

SOCIETY OF THE LYING-IN HOSPITAL

(No. of Cards.....) OF THE CITY OF NEW YORK,

17th Street and Second Avenue,

NEW YORK.

PREGNANCY.

Name of Applicant,..... Date of Application,.....189

Address,..... House,..... Floor,..... Room,.....

Application made by.....through { *old patient, City Mission, Eastern Dispensary, New York Dispensary, Hebrew Charities, previously confined,* } .....

Birthplace,..... Married,..... Single,..... Widow,..... Age,..... Para,.....

Diseases of Childhood, (*first walked*).....

.....

First Menstruation, (*age*).....Character of Menstruation, { *irregular, regular, profuse, scanty, duration, pain,* } .....

.....

Diseases of Puberty,.....

.....

Husband's History,.....

Family History.....

Character of Previous Pregnancies, Labors, Puerperiums (*miscarriages*) .....

First Labor, (*date*).... Last Labor, (*date*).... Last Menstruation, { *duration, date, quantity,* } .....

Quickening, (*date*)..... Condition in Present Pregnancy.....

Bowels, ...

DATE OF EXPECTED LABOR,.....189...

SUBSEQUENT OBSERVATIONS.

Date	(Pathological Examinations.)
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

EXAMINATION OF URINE.

Date		Date	
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Abnormality : .....

A. EXTERNAL EXAMINATION.

General Appearance, { (*face*)..... .....(*attitude*)..... .....
HEIGHT OF PATIENT.... ...FT....IN. WEIGHT OF PATIENT ...LBS.

Mammary Glands, {
(*size*)..... .....(*sensibility*)..... .....
(*consistency*)..... .....(*veins*)..... .....
(*striæ*)..... .....(*areolæ*)..... .....
(*papillæ*)..... .....(*nipple*)..... .....
(*secretion*)... ....

Abdomen, {
(*form*)..... .....(*pigmentation*)..... .....
(*striæ*).... .....(*umbilicus*)..... .....
(*abdominal fat*)..... .....(*intermittent uterine contractions*)..... ....
(*fluctuation*). .. ..(*abd. ballottement*)..... .....

Height from Symphysis of { (*fundus*).....(*ensiform*) .....
(*umbilicus*) ....

Fœtal Heart, { (*rapidity*)..... ..... (*regularity*)..... .....
(*position*).....(*more than one*).....

Fœtal Movements, (*position*)..... .(*character*).....

Uterine Sounds, { (*uterine murmur*)..... .....(*umbilical murmur*).....
(*other sounds*)..... ....

Uterus, { (*size*). .....(*form*) .....
(*position*)..... .....

Fœtus, {
(*dorsal plane*) .....(*small parts*).....
(*head*)..... .....(*movements*).....
(*size*)..... ....

Circumference of (*abdomen at umbilicus*).... ....(*pelvis*) .....

DISTANCE BETWEEN SPINES, ...DISTANCE BETWEEN CRESTS,.....

EXTERNAL OBLIQUE, { *R*..... / *L*..... TROCHANTERS,.....

(*From post, sup. spine of one side to ant. sup. spine of opposite side.*)

EXTERNAL CONJUGATE,.....

Lower Extremities, (*œdema*).. .....

B. INTERNAL EXAMINATION.

External Genitals, { (*pigmentation*).....(*secretion*)..... ....
(*veins*).....(*perineum*) .....

Vagina, {
(*length*)..... .....(*size*).....
(*secretion*) ....(*temperature*)..... .. ..
(*sensibility*).....(*mucous membrane*)..... ...

Cervix, {
(*position*) ....(*size*)..... ....
(*softening*).....(*laceration*)..... ....
(*external os*)..... ....(*internal os*) .....

Uterus, {
(*shape*).....(*consistency*).....
(*situation*).....(*mobility*)..... .....
(*presenting part*).....(*ballottement*).....

PUBIC ARCH,.....DEPTH OF SYMPHYSIS,.....

DIAGONAL CONJUGATE,..... .....

TRUE CONJUGATE,..... .....

TRANSVERSE DIAMETER OF OUTLET,.....

ANTERO-POSTERIOR DIAMETER OF OUTLET,.....

Urine, {
(*specific gravity*) .....(*reaction*)..... .....
(*albumen*.....%) (*sugar*.....%)
(*microscope*)..... ....

....

Examined by.....

RECORD OF LABOR.—OUT-DOOR SERVICE.

DIAGNOSIS, ... CONFINEMENT No.....

SOCIETY OF THE
LYING-IN HOSPITAL,
OF THE CITY OF NEW YORK,
17th Street and Second Avenue,
NEW YORK.

..... APPLICATION No.....

..... (No. of Cards .....)

RECORD OF LABOR.

Name of Applicant,..... Date of Application,.....189

Address,..... House,..... Floor,..... Room,.....

Application made by.....through { *Old Patient, City Mission, Eastern Dispensary, New York Dispensary, Hebrew Charities, Previously Confined,* } .....

Birthplace,..... Married,..... Single,..... Widow,..... Age,..... Para,.....

Diseases of Childhood, (*first walked*).....

.....

First Menstruation, (*age*).....Character of Menstruation, { *irregular, regular, profuse, scanty, duration, pain,* } .....

.....

Diseases of Puberty,.....

.....

Family History.....

Character of Previous Pregnancies, Labors, Puerperiums (*miscarriages*) .....

First Labor, (*date*).... Last Labor, (*date*).... Last Menstruation, { *duration, date, quantity,* } .....

Quickening, (*date*)..... Condition in Present Pregnancy.....

Month of Gestation,... .....Urine, { *normal, albumen, sugar, amount,* } ..... Bowels,.....

PREPARATORY STAGE.

Date, (*began*).....189 , hour..... .....M.

Sinking of Uterus, (*effect upon abdomen*).....

(*upon chest*).....(*upon bladder*).....(*upon rectum*).....

Cervix, (*shortening*) .....(*secretion*).....

Internal Os, (*amount of dilatation*).....(*presenting part*).....

Uterine Contractions, (*pain*).....(*frequency*).....

Foetal Heart, (*rapidity*) .....(*regularity*)..... .....(*position*)..... .....

Show, (*date of onset*).....(*character*) .....(*amount*)... .....

Duration,.....hours,.....minutes. Date, (*terminated*).....189 , hour.....M.

.....

FIRST STAGE.

Date, (*began*) { *observed, statement of patient,* } .....189 , hour.....M.

UTERINE CONTRACTIONS, (*effect on Os*).....(*frequency*).....

FOETAL HEART, (*rapidity*).....(*regularity*).....(*position*).....

CERVIX, (*amount of dilatation*).....(*position*)..... .....

Temperature,..... Pulse,..... Position of Parturient, { *walking, dorsal, lateral,* } .....

MEMBRANES, (*intact*).....(*spontaneous rupture*).....

(*artificial rupture, by whom*)..... VAGINAL SECRETION,.....

Vaginal Examinations, (*made by*).....(*number*).....

Visited by (*attending physician*)..... .....(*staff*) .....

Pelvis,..... Soft Parts,..... BLADDER,.....RECTUM,.....

Presence of Attendant, (*time of arrival*)..... .....

PRESENTATION,..... POSITION,..... Diet,.....

Haemorrhage, (*character*)..... .....(*treatment*).....

Medication,.....

Duration,.....hours,.....minutes. Date, (*terminated*).....189 , hour.....M.
(*from beginning of labor.*)

.....

SECOND STAGE.

Date, (*began*).....189 , hour.....M.

UTERINE CONTRACTIONS, (*effect on progress*).....(*frequency*).....

FOETAL HEART, (*rapidity*)..... .....(*regularity*).....(*position*).....

CERVIX, (*oedematous, lacerated, incarcerated*).....

Temperature,..... Pulse,..... Position of Parturient at time of delivery, { *sitting, dorsal, lateral,* }.....

MEMBRANES, (*intact*).....(*spontaneous rupture, and time*).....

(*artificial rupture, by whom and time*)..... Vaginal Secretion,.....

Vaginal Examinations, (*made by*).....(*number*).....

Pelvis,..... Soft Parts,..... Bladder,.....Rectum,.....

Presence of Attendant, (*time of arrival*).....

Visited by (*attending physician*)..... .....(*staff*) .....

PRESENTATION,..... POSITION,..... Diet,.....

Preservation of Perineum, (*method*).....

Cord about Neck, (*number of coils*).....(*treatment*).....

Haemorrhage, (*character*).....(*treatment*).....

Duration,.....hours,.....minutes. Date, (*terminated*).....189 , hour.....M.

.....

.....

.....

THIRD STAGE.

Date, (*began*).....189 , hour.....M.

Uterine Contractions, (*frequency*).....(*effect on uterus*).....

Temperature,..... Pulse,..... Position of Parturient, { *sitting, dorsal, lateral,* }.....

Vaginal Examinations, (*made by*).....(*number*).....

INTRA-UTERINE MANIPULATIONS,.....

Presence of Attendant, (*time of arrival*).....

Visited by (*attending physician*)..... .....(*staff*).....

Haemorrhage, (*character*).....(*treatment*).....

PLACENTAL DELIVERY, (*time*).....(*method*).....

Uterus, (*condition*).....(*management*).....

Duration,.....hours,.....minutes. Date, (*terminated*).....189 , hour.....M.

PERINEUM, { *intact, lacerated. operation,* }.....

.....

HEIGHT OF FUNDUS ABOVE SYMPHYSIS.

At end of third stage.....inches.

10 minutes after " " .....inches.

20 " " " " .....inches.

30 " " " " .....inches.

1 hour " " " .....inches.

SUMMARY OF LABOR.

First Stage { began, date,.....hour,..M. 189 / terminated, " ..... " ....M. " } Duration, hours,....minutes,....

Second Stage { began, " ..... " ....M. " / terminated, " ..... " ....M. " } " " .... " ....

Third Stage { began, " ..... " ....M. " / terminated, " ..... " ....M. " } " " .... " ..

Total Duration of Labor, " .... " ....

Temperature,..... Pulse,..... Height of Fundus above Symphysis,.....inches.

(*Observed one hour after completion of labor.*)

Delivered by..... ....

Assistant.....

COMPLICATIONS, OPERATIONS,

Pathological Examinations.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

SUBSEQUENT RECORD.

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) .....
13. Treatment and Remarks: .....
.....

Signature, ...

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*) ...
10. Uterus, (*height*)..(*condition*).. 11. Genitals,..... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) .....
13. Treatment and Remarks: .....
.....

Signature, ...

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M ..P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*) .....(*character*).....(*odor*) .....
13. Treatment and Remarks: .....
.....

Signature, ...

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) .....
13. Treatment and Remarks: .....
.....

Signature, ...

SUBSEQUENT RECORD.

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*)..... .....(*character*).....(*odor*) ....
13. Treatment and Remarks: .....
. .. .

Signature, ...

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*) ...
10. Uterus, (*height*)..(*condition*) .. 11. Genitals,..... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) ....
13. Treatment and Remarks: .....
....

Signature, ...

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) ....
13. Treatment and Remarks: ....
....

Signature, ...

Date,..... .....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) ....
13. Treatment and Remarks: .....
....

Signature, ...

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) .....
13. Treatment and Remarks: .....
.....

Signature, ...

Date,.....189 .....Day.

1. Countenance, ... 2. Tongue,..... 3. Bladder, ...
4. Bowels, ... 5. Sleep, ... 6. Stomach, (*Diet*).....
7. Temperature, A.M...P.M... 8. Pulse, A.M...P.M... 9. Breasts, (*condition*)...(*secreting or not*)....
10. Uterus, (*height*)..(*condition*).. 11. Genitals, ... (*nipples*) .....
12. Lochia, (*quantity*).....(*character*).....(*odor*) .....
13. Treatment and Remarks: .....
....

Signature, ...

PHYSICAL EXAMINATION ON... .....DAY AFTER LABOR.

Heart,.....Lungs,.....Breasts,.....Nipples,.....
Perineum,.....Cervix.....Quantity and character of Lochia, ...
Position, sensitiveness and mobility of Uterus,.....
Condition of Internal Os,.....
Parametria,.....Discharged..... 189...., on . ...day after labor.
Transferred ....189 .. , to. ....Hospital on.....day after labor.

Signature, ...

RECORD OF CHILD.—OUT-DOOR SERVICE.

CONFINEMENT No..... APPLICATION No.....

SOCIETY OF THE LYING-IN HOSPITAL

OF THE CITY OF NEW YORK,

17th Street and Second Avenue, (No. of Cards .....)

NEW YORK.

RECORD OF CHILD.

Date of Birth,..... .....189 . Sex,.....

Name of Mother,..... Address,..... Para,.....

Present Condition of Mother,.....

Previous Condition of Mother,.....

.....

Time of Gestation..... .....mo. Presentation, ... Position,.....

Caput Succedaneum, (*location, size,*)..... Umbilical Cord,.....

Cephalohæmatoma, (*location, size,*).....

Labor, - (*easy, tedious, instrumental,*) - ..... Duration,.....hours,.....minutes.

OBSERVATION TO BE MADE AT TIME OF BIRTH.

Primary Respirations, - (*normal, absent, delayed, superficial, (if delayed, how long,) how restored,*) - ..... Capillary Circulation, - (*normal, congested, anaemic,*) - .....

Temperature,.....

(*Taken in rectum for five minutes immediately after birth.*)

TOTAL LENGTH OF CHILD.....INCHES.

VERTEX-COCCYGEAL LENGTH.....INCHES. WEIGHT.....LBS.....OZ.

PLACENTA.

Complete, ...
Shape,.....
Weight, ...
Size, ...
Form,.....
Thickness, ...
Alterations (apoplexy, cysts, etc.)
.....
.....
.....
.....

MEMBRANES.

Complete, ...
Opening, ...
Umbilical vesicle,..
Peculiarities,.....
.....
.....

CORD.

Length, ...
Insertion, ...
Volume, ...
Peculiarities,.....
.....
.....

DIAMETERS OF CHILD.

Occipito-mental, ...in.
Occipito-frontal,.....in.
Suboccipito-bregmatic,...in.
Fronto-mental, ...in.
Trachelo-bregmatic,.....in.
Biparietal,.....in.
Bitemporal, ...in.
Bimastoid, ...in.
Bimalar,. ....in.
Bisacromial, ...in.
Dorso-sternal,.....in.
Bistrochanteric, ...in.
Sacro-pubic,... .....in.

CIRCUMFERENCES OF CHILD.

Occipito-mental,.....in.
Suboccipito-bregmatic,...in.
Occipito-frontal, ...in.
Bisacromial, ...in.
Bistrochanteric, ...in.
.....
.....

GENERAL CONDITION.

Living,..... Still born,..... Macerated, ...
Development, ... Vernix caseosa,..... Lanugo, ...
Breasts,..... Skin,..... Anus,... ..... Genitals,..... Subcutaneous fat, ...
Nose,..... ... Eyes,..... Mouth,..... Umbilicus,.....
Urine, ... Cry, - (*vigorous, weak, absent,*) - .....
Development of Cranial Bones, (*sutures, size of fontanelles,*).....
.....
Sacrum, (*depth of indentation.*).....

(*In plural births bring placentae to Resident Physician.*)

CONGENITAL ANOMALIES.

.....
.....
.....
.....
ATTENDED BY.....

GENERAL REMARKS.

.....
.....
.....
.....
.....

SUBSEQUENT RECORD.

Cord separated on.....day. Umbilicus cicatrized on..... day.

WEIGHT OF CHILD.

	LBS.	OZ.		LBS.	OZ.
At birth.....			6th day....		
1st day.....			7th day....		
2d day.....			8th day....		
3d day.....			9th day...		
4th day.....			10th day....		
5th day			11th day ..		

TEMPERATURE OF CHILD.

(Taken in rectum for five minutes.)

	A. M.	P. M.		A. M.	P. M.
At birth...			6th day....		
1st day .			7th day .		
2d day.....			8th day....		
3d day.....			9th day....		
4th day ..			10th day....		
5th day....			11th day		

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*) ..... 11. Skin, (*color, eruption*)..... 12. Stools, (*number, color*) .....
13. Genitals, ... 14. Weight,.....*lbs*.....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
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13. Genitals, ... 14. Weight, ...*lbs*..... *oz*. 15. Temperature,....A.M...P.M.

Remarks.....

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Signature, ...

Date,.....189 .....Day.

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13. Genitals, ... 14. Weight, ...*lbs*.. ..... *oz*. 15. Temperature,... A.M...P.M.

Remarks.....

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Signature, ...

Date,.....189 .....Day.

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4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
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13. Genitals, ... 14. Weight.... ....*lbs*.. .....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

Date,.....189 .....Day.

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4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
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13. Genitals, ... 14. Weight,.....*lbs*.....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

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Signature, ...

Date,.....189 .....Day.

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4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*)..... 11. Skin, (*color, eruption*) ..... 12. Stools, (*number, color*) .....
13. Genitals, ... 14. Weight, ... *lbs*.. .....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

SUBSEQUENT RECORD.

Date,.....189 .....Day.

1. Sleep, 2. Eyes, 3. Nursing,
4. Cry, 5. Nose, 6. Vomiting,
7. Breasts, 8. Mouth, 9. Urine,
10. Umbilicus, *(cord off pus)* 11. Skin, *(color, eruption)* 12. Stools, *(number, color)*
13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
Remarks

Signature,

Date, ...189 .....Day.

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4. Cry, 5. Nose, 6. Vomiting,
7. Breasts, 8. Mouth, 9. Urine,
10. Umbilicus, *(cord off pus)* 11. Skin, *(color, eruption)* 12. Stools, *(number, color)*
13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
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Signature,

Date,.....189 .....Day.

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7. Breasts, 8. Mouth, 9. Urine,
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13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
Remarks

Signature,

Date,.....189 .....Day.

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4. Cry, 5. Nose, 6. Vomiting,
7. Breasts, 8. Mouth, 9. Urine,
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13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
Remarks

Signature,

Date,.....189 .....Day.

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4. Cry, 5. Nose, 6. Vomiting,
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13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
Remarks

Signature,

Date,.....189 .....Day.

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13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
Remarks

Signature,

Date,.....189 .....Day.

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13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
Remarks

Signature,

Date,.....189 .....Day.

1. Sleep, 2. Eyes, 3. Nursing,
4. Cry, 5. Nose, 6. Vomiting,
7. Breasts, 8. Mouth, 9. Urine,
10. Umbilicus, *(cord off pus)* 11. Skin, *(color, eruption)* 12. Stools, *(number, color)*
13. Genitals, 14. Weight, *lbs. oz.* 15. Temperature, A.M. P.M.
Remarks

Signature,

SUBSEQUENT RECORD.

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*) ..... 11. Skin, (*color*, *eruption*)..... 12. Stools, (*number*, *color*) .....
13. Genitals, ... 14. Weight,.....*lbs*.....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*)..... 11. Skin, (*color*, *eruption*) ..... 12. Stools, (*number*, *color*) .....
13. Genitals, ... 14. Weight, ...*lbs*..... ....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*)..... 11. Skin, (*color*, *eruption*)..... 12. Stools, (*number*, *color*) .....
13. Genitals, ... 14. Weight, ...*lbs*.. . ... *oz*. 15. Temperature,... A.M...P.M.

Remarks.....

.....

Signature, ...

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*).... ... 11. Skin, (*color*, *eruption*)..... 12. Stools, (*number*, *color*) .....
13. Genitals, ... 14. Weight,... ....*lbs*.. .....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*)..... 11. Skin, (*color*, *eruption*)..... 12. Stools, (*number*, *color*) .....
13. Genitals, ... 14. Weight,.....*lbs*.....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

Date,.....189 .....Day.

1. Sleep, ... 2. Eyes, ... 3. Nursing,.....
4. Cry, ... 5. Nose, ... 6. Vomiting, ...
7. Breasts, ... 8. Mouth, ... 9. Urine, ...
10. Umbilicus, (*cord off pus*)..... 11. Skin, (*color*, *eruption*) . ... .. 12. Stools, (*number*, *color*) .....
13. Genitals, ... 14. Weight, ... *lbs*.. .....*oz*. 15. Temperature,....A.M...P.M.

Remarks.....

.....

Signature, ...

PHYSICAL EXAMINATION ON... .....DAY AFTER LABOR.

.....

Nose,..... Mouth,..... Skin,.....

Umbilicus,..... Weight,.....

.....

.....

Discharged .....189...., on.....day after labor.

Transferred to.....Hospital on.....day after labor.

Signature, ...

ALBUMINURIA.—OUT-DOOR SERVICE.

CONFINEMENT No..... APPLICATION No.....

BLANK FOR ALBUMINURIA.

PREVIOUS RENAL HISTORY

With especial reference to presence and duration of any of following symptoms:

(If any of these date from present pregnancy, state from which month.)

Dropsy,.....

Quantity of Urine, (*large or small*).....

Bloody Urine, ...

Albuminuria, ...

Pain over Kidneys,.....

Habitual Condition of Skin, (*free or scanty perspiration*).....

Headache, (*frontal, vertical, occipital*).....

Failure of Vision, ...

Vomiting or Diarrhoea, ...

Anorexia.....

Marked Anaemia, ...

Convulsions, Stupor or Coma,.....

Mental Symptoms,.....

History of any Infectious Disease, { *esp. scarlet fever, articular rheumatism, typhoid, syphilis, pneumonia, phthisis,* } use of alcohol,.....

PRESENT RENAL HISTORY

Dropsy, (*distribution, degree*).....

Pain over Kidneys,.....

Headache, (*position, degree, time of day when most marked*).....

.....

Impairment of Vision, (*degree, rapidity of development; one or both eyes; retinitis*).....

.....

Vomiting, Diarrhoea, Anorexia, ...

Anaemia. .....

Pulse, (*frequency, regularity, large or small, tension. Is vessel thickened?*).....

.....

Heart, { *esp. signs of hypertrophy or dilatation or both, accentuation of aortic or pulmonic 2d sound.* } Is heart distinctly feeble?.....

.....

Lungs, (*esp. expansion, signs of consolidation or of emphysema or of oedema*).....

.....

Convulsions: Time of 1st Seizure, (*month of pregnancy, stage of labor, post partum*).....

Frequency of Seizures. .....Length of Seizures and Duration of Intervals,.....

.....

Seat of Commencement, ...Mode of Spreading,.....

.....

ALBUMINURIA.

Convulsions (Cont.), Deviation of Head or Eyes,.....

Usual Position of Arms,.....

Paralysis, (*one-sided or bilateral*).....

Rigidity, (*local or general*).....

Fibrillary Twitching during Intervals, (*where located*).....

Reflexes (*esp. knee-jerks*). Are they obtainable during Intervals?.....

Condition of Pulse, Temperature and Respiration during and after Seizures,.....

.....

Pupils, size, reaction to light,.....

.....

Coma, Duration and Onset,.....

Can Patient be Roused?.....

Pupils, size, equality, reaction to light, reaction on pinching skin of neck,.....

.....

Mental Symptoms, (*esp. maniacal excitement*).....

.....

Treatment of Convulsions, (*bleeding, transfusion, saline enema, morphine, veratrum, nitro-glycerine, chloral*)..

.....

Effect of Treatment on Pulse, Temperature, Respiration, Convulsions, Coma, Urine,.....

.....

.....

.....

.....

URINARY EXAMINATION.

Date of Examination	Volume in 24 Hours	Sp. Gr.	*Albumen, (*Trace, Moderate, Abundant*)	Albumen, Quantity by Esbach	Casts, Kind. (*Few or Many*)	Blood, Pus or other Sediment

** Use following tests*—(1) *Heat and Nitric Acid.* (2) *Cold Nitric Acid (ring test).*

The practical application of the various checks on the student, used in the outdoor service, requires a set of blanks which may be called "Administrative Blanks for Students." The frequent reports sent by the student from his labor cases are always made upon the following printed form, which must be filled out in detail each time, without regard to previous reports from the same case :

SOCIETY OF THE LYING-IN HOSPITAL OF THE CITY OF NEW YORK.

251 East 17th St., New York City.

When sending to the Hospital for assistance, students must in all cases use and fill out this blank.

New York, ... o'clock, ... M.

Patient's Name, ...

Address, ...

House, ... Floor, ... Room, ...

Number of Pregnancy, ...

Month of Gestation, ...

Duration of 1st Stage, ...

" 2d " .....

" 3d " .....

Pulse, ... Temp., ...

Fœtal Heart (frequency), ... position, ...

Fœtus by abdominal palpation,
- Dorsal plane, ...
- Head, ...
- Small parts, ...
- Movements, ...

Presentation, ... Position, ...

Os uteri (size), ... condition, ...

Membranes, ...

Presenting part,
- Above brim, ...
- Engaged, ...
- At outlet, ...
- On Perineum, ...

Character and frequency of labor pains, ...

General conditions and remarks: .....

Attendant.

We insert next a page from the "Attendance Book." Each page of this book is devoted to a single case, and it is filled out by the student immediately upon his return from the completion of his case:

SOCIETY OF THE LYING-IN HOSPITAL

OF THE CITY OF NEW YORK,

SECOND AVENUE AND 17th STREET, N. Y.

Application No...... *Bag No.*..... *Confinement No.*.....

Arrival at Case.....*189*.....*(Time)*.....*a. p. m.*

Name.....

Address..... *House*..... *Floor*..... *Room*.....

Month of Gestation..... *Presentation*..... *Position*.....

Child delivered at.....*a. p. m.* .....*189*.....

Placenta delivered at.....*a. p. m.* .....*189*.....

Returned to Hospital at.....*a. p. m.* .....*189*.....

Operation .....

.....

.....

Delivered by { *Attending Physician*.....
Staff.....
Pupils.....
Operator ..... }

Assistants { *Staff* .....
Pupils..... }

Remarks.....

.....

.....

The oral reports of the students, concerning the daily condition of the postpartum cases, are made from notes written at the bedside. These reports are received by the resident physician or his representative, and are written by him on a slate, arranged in the following manner:

HEADINGS OF POSTPARTUM SLATE.

Student's Name.	Patient's Address.	LOCATION IN TENEMENT HOUSE.					Number of Days Postpartum.	Remarks.
		Front or Rear Building.	Floor.	Front or Rear Room.	Right or Left Door.	Number on Door.		

This slate serves as an index to postpartum complications which require subsequent investigation by the house staff. The assistant resident physicians record the result of their investigations of such complications in a blank book called the "Abnormality Book."

The subsequent transcription of these records and the use by the student of the small reprints of the medical histories at the bedside have been already described.

Both the outdoor and the indoor services require a set of "Administration Blanks for Patients." These blanks serve to keep a reliable record of the patients and their respective histories. Each set of blanks is a duplicate of the other, although slight differences in detail will be noted in the following *résumé*. An "Application Book" is kept, in which every applicant for treatment is recorded, and given a number in sequence of application, known as the "Application Number."

The antepartum cases are known by their application number, until after their delivery, when they receive a second, or "Confinement Number." The application number also serves, at the time of delivery, to trace the pregnancy chart which has been on file since the date of application. These application books are posted daily by the office clerk.

Headings of Indoor Service Application Book.

Date.	Application Number.	Name.	Address.	Examined by.	By whom Referred.	Where Examined.	Date to be Admitted.	Disposition of Case.

Headings of Outdoor Service Application Book.

Date.	Application Number.	Name.	Address.	Examined by.	Attended by.	Confinement Number.	Date of Attendance.	Date of Discharge.	Month of Gestation.	Remarks.

A card bearing the address of the Hospital, the name and address of the patient, and her application number, is given to every woman at the time of her application. These cards are to be returned to the Hospital whenever the patient needs attendance. They serve as an index to the application numbers, and insure the selection of the proper history blank. A record of the progress of the outdoor labors is kept on the three blank spaces on the face of the cards, by the use of the time-clock stamp. All the cards of patients in labor are kept on a reference file on the office desk. The obverse and reverse of these cards are reproduced here: the reverse is wholly for the information of the patient. The different districts of the city are designated by varying the color of the card.

PATIENT'S CARD FOR INDOOR SERVICE.

Society of the Lying-In Hospital,

SECOND AVENUE AND 17th STREET,

New York City.

APPLICATION CARD.

Application No...... *Date*..... *189*.....

Name.....

Address.....*House*.....*Floor*.....*Room*.....

Return with this card for admission to Hospital

..... *189*.....

If taken with labor pains before above date, come to Hospital at once, bringing this card with you.

(SEE OTHER SIDE)

PATIENTS COMING TO HOSPITAL FOR ADMISSION SHOULD BRING WITH THEM A SET OF BABY CLOTHES.

Application for admission to Hospital for care in childbed should be made between the hours of 1 and 2 P. M.

Emergency cases will receive attention at any time.

IF NECESSARY AN AMBULANCE WILL BE FURNISHED TO BRING PATIENTS TO THE HOSPITAL.

Visitors will not be allowed to see patients, but may inquire about them as often as they desire.

Women without homes will be referred to some suitable charitable institution upon leaving the Hospital.

PATIENT'S CARD FOR OUTDOOR SERVICE—MAIN HOSPITAL.

Date.....*189* *A. N.*.....

PUPILS

SOCIETY OF THE

LYING-IN HOSPITAL,

2d Ave. & 17th St.,

NEW YORK CITY.

Para.

Name.....

Address.....*House*.....*Floor*.....*Room*.....

CALL RECEIVED	DEPARTED	RETURNED

(SEE OTHER SIDE)

Free medical attendance in childbed will be furnished at their homes to women who are unable to pay for such services.

Applications for attendance should be made at the HOSPITAL, 2nd AVENUE & 17th STREET, between the hours of 1 and 2 P. M.

Emergency cases will receive attention at any time.

In casi di parto, si prestano gratuitamente cure mediche al domicilio delle parturienti, quando questo siano povere e non abbiano i mezzi per pagani.

Le richieste per attenere queste cure gratuite devono essere fatte al OSPEDALE, 2da AVENUE e STRADA 17, nelle ore prescritte cive dalle 1 alle 2 P. M.

Nei casi urgenti si provederei immediatamente a qualunque ora.

Unentgeldliche ärztliche Behandlung von Wöchnerinnen oder Frauen, welche ihre Niederkunft erwarten, falls sie nicht für die Behandlung zahlen können.

Man melde sich im Hospital, 2. Ave. und 17. Str., zwischen 1 und 2 Uhr Nachmittags.

Dringende Fälle werden zu jeder Zeit behandelt.

קינפּעטאָרינס וועלכע ערוואַרטען ענטבּונדען צו ווערדען קענען בעקומען איין דאָקטאָר אומיאַנסט, אימפּאַלם זייא קענען קיין נעלד צאָהלען.

מען זאָלל זיך מעלדען אין האָספּיטאל 2טע עוועניו אינד 17טע סטריט, צווישען 1 אונד 2 אוהר נאַכמיטטאַם.

וען אין אַ נרויבען געפאַהר קען מען זיך צו יעדער צייט מעלדען.

When a patient is admitted to the indoor service, the following admission blank is filled out and kept on file in the office. The admission card, also presented below, is properly filled out and is sent to the wards with the patient. The reverse of the card is written when the child is born. The facts recorded on these two blanks enable the Resident Physician to fill out the birth certificate or other blanks required by the City Bureau of Vital Statistics.

Society of the Lying-In Hospital,

SECOND AVENUE AND 17TH STREET,

NEW YORK CITY.

ADMISSION BLANK.

On Admission, Stamp with Time Clock.

Name.....

How admitted.....

Address .....House.....Floor.....Room.....

Age.....Color.....Single—Married—Widow.

Occupation.....Birthplace.....

How long in U. S.....In City .....

Father's name.....Birthplace.....

Mother's name.....Birthplace.....

Friend's name.....

Address .....

Number of previous children.....Number now living.....

Father of child, name.....

Age .....Address.....

Birthplace .....Occupation.....

Remarks.....

Stamp with Time Clock here.

SOCIETY OF THE LYING-IN HOSPITAL.

2d AVENUE & 17th ST., NEW YORK CITY.

CARD OF ADMISSION TO WARD.

Application No. ..... Confinement No. .....

Admit .....

to Ward .....

Date of Admission ..... 189.....

Diagnosis .....

.....

Date of Discharge ..... 189.....

Cause of Discharge .....

..... M. D.

(SEE OTHER SIDE)

CHILD.

Date of Birth .....

Name .....

Sex ..... Color .....

Presentation .....

Position .....

Period of Gestation .....

Operation .....

.....

.....

Confined by .....

The office clerk copies from the attendance book, which is filled out by the student, the facts demanded by the "Attendance Cards." These cards contain fifty lines, and the cases are entered in the order of their confinement. Cards are used to duplicate this part of the attendance book, because they are more compact, and the different pages of the attendance book must often be used by various officers and clerks at the same time; a

book does not permit this easy reference. These cards form an index to the confinement numbers of the cases, and to the histories. The same form of card is used to record the cases in both services.

Headings from the Attendance Cards.

Number on Card.	Date.	Application Number.	Name.	Address.	Diagnosis Position.	Diagnosis Presentation.	Month of Gestation.	Confinement Number.	Confined by.	Remarks.

The Resident Physician writes a brief *résumé* of all operations done by any members of the medical staff, or by one of the Attending Physicians, in a special book, the "Operation Book."

Headings of Operation Book.

Date.	Operation Number.	Confinement Number.	Diagnosis.	Operation.	Operator.	Anæsthetic.					Remarks.
						Drug used.	Quantity.	Duration.	Condition of Patient under Drug.	Anæsthetizer.	

The following blank is used to record any complication discovered among the antepartum applicants. These "Abnormality Blanks" for the cases of both services are made out by the Assistant Resident Physicians, and are kept on a reference file in the office. They are carefully scrutinized

by each Attending Physician immediately upon assuming control of the Hospital, in order that he may have in mind any abnormal cases falling due during his service.

ABNORMALITY BLANK.

Application No..... *Date,*.....*189*.....

Name,..... *Para,*.....

Address,..... .....*House,*.....*Floor,*.....*Room*

DATE OF EXPECTED LABOR,.....*189*.....

History of Previous Labors.....

MENSURATION.

Between Spinæ,.....*Right Oblique,*.....*Depth of Symphysis,*.....

Between Cristæ,.....*Left Oblique,*.....*Pubic Arch,*.....

Conjugata Externa.....*CONJ. DIAGONALIS,*.....*CONJ. VERA,*.....

Transverse of Outlet,..... *Antero-Posterior of Outlet,*.....

URINANALYSIS.

Specific Gravity,.....*Reaction,*.....

Sugar,.....*Urea,*.....

Albumen,.....

Microscope,.....

REMARKS.

.....

.....

.....

Examined in Service of.....*Attending Physician*

Examined by.....

DATE.	SUBSEQUENT OBSERVATIONS.

The student's first duty upon returning to the Hospital after any service, is to report to the Resident House Physician or his representative. After making this report, he must record upon the History Charts the observa-

tions he has made, and attach his signature thereto. These records are inspected each evening by one of the Assistant Resident Physicians, for the purpose of detecting and correcting inconsistencies and errors. When a case has been discharged, and the history has been signed by the Resident Physician, it is turned over to the Registrar's office.

The checks on the loss or disappearance of any history are furnished by a reference to the attendance book or to the attendance cards. The check on the completeness of a history is furnished by a comparison with the attendance book and with the operation book.

IV. The Registrar's Office.

This department is a feature in hospital organization which, as far as we know, is a new departure. There are three workers in the Registrar's department of this Hospital. They care for the cards, attend to the binding of the histories, and prepare the statistics for reference and publication. The Registrar is a member of the Medical Board, and holds office for one year; he oversees the work of the Assistant Registrar and of the Registrar's clerk. The five Attending Physicians rotate in order in this duty. Each Registrar makes to the Medical Board a complete statistical report on the cases observed during his year of service. The Medical Board subsequently publishes these reports singly or in various combinations, as seems advisable. The Assistant Registrar is also one of the Assistant Attending Physicians. It is the duty of this officer to number the histories from the attendance cards; to discover all the points of interest in each history, and to summarize these at the upper left-hand corner of the Record of Labor Chart under "Diagnosis." He also indicates in the upper right-hand corner of the same chart the number of cards required for each history. (This will be explained later on, under the subject of the Card Index.) The manual labor of compiling the statistics devolves upon the Registrar's clerk, who is a permanent employee of the Hospital.

The statistical material divides itself easily into two main classes: *First.* Those facts which are common to all the histories, and relate to the normal processes of pregnancy, labor, and the puerperium. *Second.* The facts which vary in each history and which comprise the complications and abnormalities of an obstetrical service.

The Large Statistic Book.—The first set of facts are recorded in large books arranged so that each history occupies a line, and each kind of observation a perpendicular column. Each page contains one hundred lines, and, therefore, one hundred histories. The headings of the fourteen pages which are devoted to the records of each hundred histories are a repetition, in so far as observations of the first ten postpartum days are concerned. Postpartum observations which extend beyond this period of ten days are not considered in this book. Such cases are usually complicated, and recorded as such in the card system described below. The record is made by a single mark in the square formed by the crossing of the

appropriate lines and columns. The results of each hundred histories are totalized by adding the columns at the foot of the page. In the case of twins, a double mark is placed in the squares of the "Record of Child," opposite the history's number.

The check on the correctness of the column totals on any page is obtained by adding the totals of the subdivision columns under each subject; these must always add up one hundred, *i.e.*, the number of cases on a page.

The figures obtained by adding the columns of each hundred histories are transcribed to the proper columns of a set of pages in this large Statistic Book. In this summary each line represents the totals of one hundred histories, instead of a single history, and the results of one thousand histories are concentrated into ten lines.

It is possible to add up at any time the columns of these summarizing pages and prepare a statistical report for any number of cases. This can be done with a minimum of work, and at very short notice.

Headings of Large Statistic Book.

Record of Pregnancy.

Number.	SOURCE OF APPLICATION.	URINE.	BONY PELVIS.		
	Treated before. Former Patient. Hebrew Charities. Outside Hospitals. Outside Physicians. Midwives. Reputation. Unknown.	Normal. Albumina. Glycosuria. Diabetes. Not Observed.	Spines. Crests. R L Ext. Obliques. Ext. Conjugate. Trochanters. Diagonal Conjugate. True Conjugate. Depth of Symphysis.	Weight. Lbs.	Height. Ft. In.

Record of Labor.

BIRTHPLACE.	AGE.	CIVIL CONDITION.
United States. Russia. Poland. Austria. Hungary. Roumania. Germany. Ireland. England. Italy. Holland. Sweden. Switzerland. Scotland. Canada. Unknown.	19 or under. 20—24. 25—29. 30—34. 35—39. 40—44. 45—49. 50—54. 55—59. 60—64.	Married. Single. Widowed.

Record of Labor.—(Continued.)

FORMER PREGNANCIES.	PARA.	MONTH OF GESTATION.
Previous Abortions.	I.	First.
Previous Premature Labors.	II.	Second.
	III.	Third.
Previous Stillbirths.	IV.	Fourth.
Previous Difficult Labors.	V.	Fifth.
	VI.	Sixth.
	VII.	Seventh.
	VIII.	Eighth.
	IX.	Ninth.
	X.	Tenth.
	XI.	
	XII.	
	XIII.	
	XIV.	
	XV.	
	XVI.	
	XVII.	
	XVIII.	
	XIX.	

Record of Labor.—(Continued.)

CONDITION OF CHILD.	URINE.	PRESENTATION.	DISPLACEMENT OF FŒTAL PARTS.		
			Prolapse.	Extension.	Placenta Prævia.
Living.	Normal.	Vertex.	Funis.	Legs.	Central.
Stillborn.	Albuminia.	Ear.	Foot.	Arms.	Partial.
Stillborn and Macerated.	Glycosuria.	Brow.	Hand.	Hands.	Marginal.
Monster.	Diabetes.	Face.			
		Occipito Posterior at Birth.			
		Shoulder.			
		Breech.			
		Not Observed.			

Record of Labor.—(Continued.)

First Stage.

VAGINAL EXAMINATIONS.		MEDICATION.	HÆMORRHAGE.	DURATION.
None.	By Attending Physician.	Vaginal Douche.	Slight.	Hours.
One.	By Staff.	Whiskey.	Moderate.	Minutes.
Two.	By Pupil.	Quinine.	Profuse.	
Three.	By Staff and Pupil.	Morphine.	Demanded Treatment.	
Four.	By Outside Attendant.	Chloroform.	No Treatment.	
Five.	Number not Observed.	Chloral.		
Six.				
Seven.				
Eight.				
Nine.				
Ten or more.				

Record of Labor.—(Continued.)

SECOND STAGE.

POSITION AT TIME OF DELIVERY.	MEMBRANES.	VAGINAL EXAMINATIONS.	
Dorsal.	Intact.	None.	By Attending Physician.
Lateral.	Artificially.	One.	By Staff.
Not Observed.	Spontaneously.	Two.	By Pupil.
	Artificially—1st Stage.	Three.	By Staff and Pupil.
	Spontaneously—1st Stage.	Four.	By Outside Attendant.
	Not Observed.	Five.	Number not Observed.
		Six.	
		Seven.	
		Eight.	
		Nine.	
		Ten or more.	

Record of Labor.—(Continued.)

SECOND STAGE.

MEDICATION.	CORD ABOUT.			HÆMORRHAGE.	DURATION.
	Neck.	Legs.	Arms.		
Vaginal Douche.	Once.	Once.	Once.	Slight.	Hours.
Ergot.	Twice.	Twice.	Twice.	Moderate.	Minutes.
Morphine.	Three Times.			Profuse.	
Chloroform.	Four Times.			Demanded Treatment.	
Chloral.	Five Times.			No Treatment.	

Record of Labor.—(Continued.)

THIRD STAGE.

MEDICATION.	HÆMORRHAGE.	DELIVERY OF PLACENTA.	IMPLANTATION OF CORD.
Vaginal Douche.	Slight.	Spontaneous.	Central.
Uterine Douche.	Moderate.	Expression.	Lateral.
Acetic Acid Douche.	Profuse.	Manual Extraction.	Marginal.
Ergot.	Demanded Treatment.		Velamentous.
Morphine.	No Treatment.		
Chloroform.			
Chloral.			

Record of Labor.—(Continued.)

THIRD STAGE.

CONDITION OF PLACENTA AND MEMBRANES.	TEMPERATURE ONE HOUR AFTER LABOR.	PULSE ONE HOUR AFTER LABOR.
Normal.	95.5– 96.4	40– 49.
Calcareous.	96.5– 97.4	50– 59.
Succenturiata.	97.5– 98.4	60– 69.
Apoplectic.	98.5– 99.4	70– 79.
Cystic.	99.5–100.4	80– 89.
Fibrous.	100.5–101.4	90– 99.
Fatty.	101.5–102.4	100–109.
Not Observed.	102.5–103.4	110–119.
	103.5–104.4	120–129.
	104.5–105.4	130–139.

Record of Labor.—(Concluded.)

THIRD STAGE.

DURATION.		PERINEUM.		TOTAL DURATION LABOR.			DAY OF DISCHARGE.
Hours.	Minutes.	Intact.	Lacerated.	Not Observed.	Operation.	Hours.	Minutes.	Not Observed.	Number of Cards.	Labor.
										First.
										Second.
										Third.
										Fourth.
										Fifth.
										Sixth.
										Seventh.
										Eighth.
										Ninth.
										Tenth.

Daily Record of Mother.

TEMPERATURE.		PULSE.	
A.M.	P.M.	A.M.	P.M.
96.5– 97.4	96.5– 97.4	50– 59.	50– 59.
97.5– 98.4	97.5– 98.4	60– 69.	60– 69.
98.5– 99.4	98.5– 99.4	70– 79.	70– 79.
99.5–100.4	99.5–100.4	80– 89.	80– 89.
100.5–101.4	100.5–101.4	90– 99.	90– 99.
101.5–102.4	101.5–102.4	100–109.	100–109.
102.5–103.4	102.5–103.4	110–119.	110–119.
103.5–104.4	103.5–104.4	120–129.	120–129.
104.5–105.4	104.5–105.4	130–139.	130–139.

Daily Record of Mother.—(Concluded.)

BREASTS.	UTERUS.		LOCHIA.
	Height above Symphysis in Inches.	Condition.	
Normal. Caked. Lymphangitis. Abscess. Nipples Fissured.	In Pelvis. 1 Inch. 2 Inches. 3 " 4 " 5 " 6 " 7 " 8 " 9 " 10 " 11 " 12 " 13 " 14 " 15 " Not Observed.	Firm. Flabby. Not Observed.	Absent. Sanguineous. Sero-sanguineous. Serous. Sweet. Foul.

Daily Record of Child.

W'GT.	TEMPERATURE.		CORD.	EYES.
	A.M.	P.M.		
Pounds. Ounces.	95.5– 96.4 96.5– 97.4 97.5– 98.4 98.5– 99.4 99.5–100.4 100.5–101.4 101.5–102.4 102.5–103.4 103.5–104.4 104.5–105.4	95.5– 96.4 96.5– 97.4 97.5– 98.4 98.5– 99.4 99.5–100.4 100.5–101.4 101.5–102.4 102.5–103.4 103.5–104.4 104.5–105.4	Normal. Suppurating.	Normal. Inflamed. Pus.

Record of Child.

SEX.	WEIGHT AT BIRTH.
Not Noted. Abortion. Male. Female.	1–15 Ounces. 1– $1\frac{15}{16}$ Pounds. 2– $2\frac{15}{16}$ " 3– $3\frac{15}{16}$ " 4– $4\frac{15}{16}$ " 5– $5\frac{15}{16}$ " 6– $6\frac{15}{16}$ " 7– $7\frac{15}{16}$ " 8– $8\frac{15}{16}$ " 9– $9\frac{15}{16}$ " 10–$10\frac{15}{16}$ " 11–$11\frac{15}{16}$ " 12–$12\frac{15}{16}$ " 13–$13\frac{15}{16}$ " 14–$14\frac{15}{16}$ " 15–$15\frac{15}{16}$ " 16–$16\frac{15}{16}$ "

Record of Child.—(Continued.)

VERTEX—COCCYGEAL LENGTH AT BIRTH.	TOTAL LENGTH AT BIRTH.
½– 1¾ Inches.	½– 1¾ Inches.
2– 2¾ "	2– 2¾ "
3– 3¾ "	3– 3¾ "
4– 4¾ "	4– 4¾ "
5– 5¾ "	5– 5¾ "
6– 6¾ "	6– 6¾ "
7– 7¾ "	7– 7¾ "
8– 8¾ "	8– 8¾ "
9– 9¾ "	9– 9¾ "
10–10¾ "	10–10¾ "
11–11¾ "	11–11¾ "
12–12¾ "	12–12¾ "
13–13¾ "	13–13¾ "
14–14¾ "	14–14¾ "
15–15¾ "	
16–16¾ "	
17–17¾ "	
18–18¾ "	

Record of Child.—(Continued.)

TOTAL LENGTH AT BIRTH.	TEMPERATURE AT BIRTH.	CORD DETACHED ON.
15–15¾ Inches.		
16–16¾ "		
17–17¾ "		
18–18¾ "		
19–19¾ "		
20–20¾ "		
21–21¾ "		
22–22¾ "		
23–23¾ "		
	95.5– 96.4	First Day.
	96.5– 97.4	Second "
	97.5– 98.4	Third "
	98.5– 99.4	Fourth "
	99.5–100.4	Fifth "
	100.5–101.4	Sixth "
	101.5–102.4	Seventh "
	102.5–103.4	Eighth "
	103.5–104.4	Ninth "
		Tenth "
		Not Detached.

Record of Child.—(Concluded.)

EYES AT BIRTH.	DAY DISCHARGED.	DEATH OF CHILD.
Normal.	Labor Day.	Labor Day.
Inflamed.	First "	First "
Pus.	Second "	Second "
	Third "	Third "
	Fourth "	Fourth "
	Fifth "	Fifth "
	Sixth "	Sixth "
	Seventh "	Seventh "
	Eighth "	Eighth "
	Ninth "	Ninth "
	Tenth "	Tenth "

The Card Index.—The card system of keeping records is too well known and too universally used to need any description here. We have applied it to the recording of the complications and the exceptional phenomena of our obstetrical service. This system is more elastic and more flexible than any record book. It allows also of additions and subtractions without mutilation, and it permits the handling and the arrangement of the records into various groups, as a book cannot. The cards used are five and one-half inches by six and three-quarter inches in size. They are printed on one side, and after being filled out are stored in boxes, each kind of card having its own box. These boxes are kept in a cabinet built for the purpose. Each important subject has a special card, and there is a general card for miscellaneous subjects. These cards are reproduced in reduced size.

ABORTION.

Application No...... **Confinement No.**.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Symptoms,.....

.....

Complications,.....

.....

.....

Treatment,.....

.....

.....

.....

Result,.....

.....

ACCOUCHEMENT FORCÉ.

Application No. _____ Confinement No. _____

BIRTHPLACE, _____ AGE, _____ PARA, _____ MONTH OF GESTATION, _____

LABOR, _____

_____ DELIVERED BY { Dispensary. Outside Physician. Midwife. Unattended.

PRESENTATION, _____ POSITION, _____

Fœtal Heart, _____

Indication, _____

_____

Complications, _____

_____

Perineum, _____ Cervix, _____

Treatment, _____

_____

_____

Result, _____

_____

ALBUMINURIA.

ANTE-PARTUM. DURING LABOR. POST-PARTUM.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY*. { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*.....

Symptoms,.....

.....

.....

.....

Previous Renal History,.....

.....

.....

Urine,.....

Complications,.....

Treatment,.....

.....

Result,.....

BREECH PRESENTATION.

Application No..... Confinement No.....

BIRTHPLACE..... AGE..... PARA..... MONTH OF GESTATION.....

LABOR, ...

..... DELIVERED BY { Dispensary. Outside Physician. Midwife. Unattended.

PRESENTATION..... POSITION,.....

Pelvis,.....

.....

Soft Parts,.....

.....

Complications,.....

.....

Treatment,.....

.....

.....

Result,.....

.....

BREECH EXTRACTION.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

..... *DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Position of { Arms,..... Legs.....

Foetal heart,.....

Funis,.....

Complications (after-coming head),.....

.....

Treatment,.....

.....

.....

.....

Result,.....

BREECH EXTRACTION, AFTER VERSION.

Application No..... Confinement No.....

BIRTHPLACE..... AGE..... PARA..... MONTH OF GESTATION.....

LABOR, ...

..... DELIVERED BY { Dispensary. Outside Physician. Midwife. Unattended.

PRESENTATION,..... POSITION.....

Presentation before version,..... Position before version,.....

Position of { Arms, ... Legs, ...

Fœtal heart, ...

Funis,..... .....

Complications { extended arms, after-coming head, } .....

.....

Treatment (methods used,) .....

.....

.....

.....

Result, ...

CURETTING.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*,..... *PARA*..... *MONTH OF GESTATION*,.....

LABOR,.....

..... *DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Indication, ...

.....

Technique, ...

.....

Complications, ...

.....

.....

Treatment, ...

.....

Result, ...

.....

DEATH OF CHILD.

Application No...... **Confinement No.**.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*.....

Age of Child,.....

Heart,..... **Lungs**,.....

Umbilical Stump,.....

Symptoms,.....

.....

.....

.....

Autopsy, ...

.....

.....

.....

DEATH OF MOTHER.

Application No...... **Confinement No.**.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Complications before delivery,.....

.....

Operations or manipulations,.....

.....

Complications after delivery,.....

Day of Death, { antepartum,..... postpartum,.....

Autopsy,.....

.....

Cause of Death,.....

.....

DEFORMED PELVIS.

Application No..... Confinement No.....

BIRTHPLACE..... AGE..... PARA..... MONTH OF GESTATION.....

LABOR, ... } Hospital. Outside Physician. Midwife. Unattended,
..... DELIVERED BY
PRESENTATION..... POSITION.....

.....
.....
.....
.....
.....
.....
.....
.....
.....

Result,.....
.....

DISPLACEMENT OF FOETAL PARTS.

HANDS, FEET, FUNIS.

Application No,..... Confinement No.....

BIRTHPLACE..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*.....

LABOR, ... } Dispensary. Out-side Physician. Midwife. Unattended.
.....*DELIVERED BY*
PRESENTATION,..... *POSITION*,.....

Hands,.....
Feet, ...
Funis,.....
Foetal heart,.....
Complications,.....
.....
.....
Treatment, ...
.....
Result,.....
.....

EXTRACTION. { PLACENTA. MEMBRANES.

Application No...... **Confinement No.**.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Hemorrhage,.....

Condition of Placenta,.....

.....

Complications,.....

.....

.....

Treatment,.....

.....

.....

Result,.....

.....

FACE PRESENTATION. BROW PRESENTATION.

Application No...... **Confinement No.**.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Pelvis,.....

.....

Soft Parts,.....

.....

Complications,.....

.....

Treatment, (manual rectification.).....

.....

.....

Result,.....

.....

FEVER.

Application No..... Confinement No.....

Birthplace..... Age,..... Para,..... Month of Gestation,.....

Labor, ... Delivered by { Dispensary. Out-side Physician. Midwife. Unattended.

Presentation,..... Position,.....

Day	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20	
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm
106°																																								
105°																																								
104°																																								
103°																																								
102°																																								
101°																																								
100°																																								
99°																																								
98°																																								
97°																																								
Pulse																																								
Respiration.																																								
Height of uterus																																								

Lochia,..... Breasts,..... Bowels,.....

Uterus,..... Parametria,..... Complications,.....

FŒTAL DEFORMITIES.

Application No..... Confinement No.....

Birthplace,..... Age,..... Para,..... Month of Gestation,.....

Labor, ... Delivered by { Dispensary. Outside Physician. Midwife. Unattended.

Presentation,..... Position,.....

Fœtal Movements,.....

Fœtal Heart,.....

Complications of Labor,.....

.....

Mother's History, { (a) Constitutional, ... (b) In pregnancy, ...

Father's History, (Constitutional), ...

Condition of Placenta,.....

Condition of Child,.....

Autopsy,.....

.....

FORCEPS. { HIGH. MEDIUM. LOW.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Foetal heart .....

Indications.....

.....

Complications,.....

.....

.....

Cervix..... Perineum.....

Treatment,.....

.....

.....

Result,.....

HEMORRHAGE.

ANTEPARTUM. DURING LABOR. POSTPARTUM.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,.....

Antepartum, (how long,).... Stage of Labor,.... Postpartum, (how long,)....

Cause of the hemorrhage,.....

Symptoms,.....

.....

Placenta implantation, ...

Condition of Placenta, ...

.....

Foetal heart, ...

Complications, ...

Treatment, ...

.....

Result, ...

ICTERUS NEONATORUM.

Application No..... Confinement No.....

Birthplace,..... Age,..... Para,..... Month of Gestation,.....

Labor, ...

..... Delivered by { Dispensary. Outside Physician. Midwife. Unattended.

Presentation,..... Position,.....

Begun on.....day after birth,.....

Subsided on.....day after birth, ...

Complications, ...

.....

.....

Treatment, ...

.....

.....

.....

Result,.....

.....

MAMMARY ABSCESS { CHILD. MOTHER.

Application No..... Confinement No.....

Birthplace,..... Age,..... Para,..... Month of Gestation,.....

Labor, ...

..... Delivered by { Dispensary. Outside Physician. Midwife. Unattended.

Presentation,..... Position,.....

Symptoms,.....

.....

Complications,.....

.....

.....

Treatment, ...

.....

.....

.....

Result,.....

.....

OCCIPITO—POSTERIOR POSITION.

Application No...... **Confinement No.**.....

BIRTHPLACE,..... AGE,..... PARA,..... MONTH OF GESTATION,.....

LABOR, ...

..... DELIVERED BY { Dispensary. Outside Physician. Midwife. Unattended.

PRESENTATION,..... POSITION,.....

Pelvis,.....

.....

Soft Parts,.....

.....

Complications,.....

.....

Treatment (manual rectification), ...

.....

.....

Result,.....

.....

PERINEORRHAPHY.

Application No...... **Confinement No.**.....

BIRTHPLACE,..... AGE,.... PARA,.... MONTH OF GESTATION,.....

LABOR,.....

..... *DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION,..... POSITION,.....

Laceration, ...

.....

Treatment, (Technique.) .....

.....

.....

.....

Complications,.....

.....

.....

Result,.....

.....

PLACENTA PRAEVIA.

MARGINAL. PARTIAL. CENTRAL.

Application No..... Confinement No.....

BIRTHPLACE..... *AGE*..... *PARA*..... *MONTH OF GESTATION*.....

LABOR.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION, (foetal,) ..... *POSITION*, (foetal,) .....

Foetal heart,.....

Symptoms,.....

.....

Complications,.....

.....

Treatment,.....

.....

.....

.....

Result,.....

.....

PLURAL BIRTHS.

TWINS. TRIPLETS.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION, I... II... III... *POSITION*, I... II... III...

SEX, I..... II..... III.....

Placenta, { single,..... double,.....

Amniotic cavity, { one, two, three, } .....

Funis,.....

.....

Complications of labor,.....

.....

.....

Result,.....

.....

PNEUMONIA.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*..... *PARA*..... *MONTH OF GESTATION*,.....

LABOR,..... } Dispensary. Out-side Physician. Midwife. Unattended.
.....*DELIVERED BY*
PRESENTATION,..... *POSITION*,.....

Operations,.....

Puerperium,.....

Pneumonia began on.....day of puerperium.

Pneumonia terminated on.....day of puerperium, (defervescence.)

Complications,.....

.....

Treatment, ...

.....

.....

Result,.....

.....

SHOULDER PRESENTATION.

Application No..... Confinement No.....

BIRTHPLACE,..... AGE,..... PARA,..... MONTH OF GESTATION,.....

LABOR, ... } Dispensary. Outside Physician. Midwife. Unattended.
..... DELIVERED BY
PRESENTATION,..... POSITION,.....

Pelvis,.....

Position of { Arms,..... Legs,.....

Funis,.....

Complications,.....

.....

Treatment, ...

.....

.....

Result,.....

.....

STILL BIRTH.

Application No..... Confinement No.....

BIRTHPLACE..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR.....

.....*DELIVERED BY* { Dispensary. Out-side Physician. Midwife. Unattended.

PRESENTATION..... *POSITION*,..... {

Foetal Movements,.....

Foetal Heart, ...

Complications of Labor,.....

.....

Mother's History, { (a) Constitutional, ... (b) In pregnancy, ...

Father's History, (Constitutional.) .....

Condition of Placenta,.....

Condition of Child, (macerated.) .....

Autopsy,.....

.....

SUPPURATION OF UMBILICAL STUMP.
CONJUNCTIVITIS. { ONE EYE. BOTH EYES.

Application No..... Confinement No.....

BIRTHPLACE..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. Outside Physician. Midwife. Unattended.

PRESENTATION,..... *POSITION*,..... {

Begun on.....day after birth,.....

Subsided on.....day after birth, ...

Complications, ...

.....

.....

Treatment, ...

.....

.....

.....

Result,.....

.....

VERSION. { CEPHALIC. / PODALIC.

Application No..... Confinement No.....

BIRTHPLACE,..... *AGE*,.... *PARA*,.... *MONTH OF GESTATION*,.....

LABOR,.....

.....*DELIVERED BY* { Dispensary. / Out-side Physician. / Midwife. / Unattended.

PRESENTATION,..... *POSITION*,.....

Foetal heart,.....

Indications,.....

.....

Complications,.....

.....

Perineum,..... Cervix,.....

Treatment, { Hand used,..... / ..... / Foot seized,..... / ..... }

Result,.....

.....

Application No..... Confinement No.....

BIRTHPLACE,..... AGE,..... PARA,..... MONTH OF GESTATION,.....

LABOR. .....

..... DELIVERED BY { Hospital. / Outside Physician. / Midwife. / Unattended.

PRESENTATION,..... POSITION,.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Result,.....

.....

The checks on these cards are the following:

1. A cross index of all the other cards belonging to that particular history is written under "Labor" on the heading of each card. This permits one to compare the cards of any history with one another.

2. The number of cards demanded by each history is recorded under the column, "Number of Cards," in the large Statistic Book. The total of this column gives the number of cards in every hundred histories.

3. The number of cards is recorded also in a special Card Tally Sheet, on which each line represents one hundred histories, and the columns represent the kinds of cards (see accompanying figure for a sample of such a sheet). The totals of the lines give the number of cards in each hundred histories, and the totals of the columns give the numbers of cards of each kind.

Sample Card Tally Sheet.

Number of Volume of Histories.	Abortions.	Accouchement Forcé.	Albuminuria.	Births Premature.	Breech Extraction.	Curetting.	Death of Child.	Death of Mother.	Fever.	Etc.	Total Number of Cards.
5001–5100	4	1	1	6	3	1	2	0	8	etc.	52
5101–5200	2	0	2	3	5	3	1	1	6	etc.	62
etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.

We thus have the total number of cards recorded in two places: in the large Statistic Book, where it is itemized on the basis of the individual history; and on the tally sheet, where it is itemized on the basis of the individual cards. If any card is not made out, the two totals will not tally. If any card once made out is lost, the number of the remaining

cards will not tally with these totals. The missing card can be located in the proper hundred of histories, and it must then be supplied by reference to the histories themselves.

Such is the method of preparing statistics which is used by the Medical Board of this Society. It means an outlay of a certain sum of money for the payment of a permanent clerk and for the necessary stationery. The expense, however, need deter but few, for one thousand dollars will more than cover the annual outlay. By such a system the more routine part of the work can be kept in a condition of constant readiness for publication. Of course there will remain for the members of the Medical Board a large expenditure of time and special work before each report is edited and published.

PRACTICAL INSTRUCTION GIVEN BY THIS HOSPITAL TO GRADUATE AND UNDERGRADUATE PUPILS.

Practical instruction is divided to-day into five classes, as follows:

A. A Course of Preliminary Instruction is given to Graduate and Undergraduate Pupils alike, which includes:

- *a.* The Care and Preparation of the Surgical Dressings Used in the Service of the Hospital.
- *b.* The Care and Uses of the Contents of the Labor and Postpartum Bags.
- *c.* The Keeping and Recording of the Histories of Pregnancy, Labor, and Child.
- *d.* The Principles of Asepsis and Antisepsis, especially as Applied to the Examining Hand.
- *e.* And, finally, the Principles in the Treatment of Normal Labor, and the Care of the Puerperal Woman and her Child.

B. Examination of Pregnant Women.

- *a.* Antepartum Instruction.

C. The Care of Labor Cases.

- *a.* Intrapartum Instruction.

D. Treatment of Mother and Child after Confinement.

- *a.* Postpartum Instruction.
  1. Outdoor or Dispensary Service.
  2. Indoor or Ward Service.

E. Obstetrical Clinics—Normal Labor and Obstetric Surgery.

A. Preliminary Instruction.

As far as possible, the Medical Board aim at a graded course of instruction for the undergraduates entering upon their two weeks' term of service. To this end the junior pupil, during the first few days of his service, is required to observe the management of the confinements in the obstetrical clinics of the Institution or in the outdoor service, and to visit puerperal women and their children in the tenement houses. He is instructed in the

FIG. 1.—LABOR BAG.

(*From a photograph.*)

care of mother and child, both in the wards and outdoor service, as well as in the contents of the labor and postpartum bags and their uses.

It may be stated here that students are termed Juniors in the first, and Seniors in the latter, half of their term of service. As soon as the student has signed his name to the rules of the Institution and been assigned to his quarters, he is given the above preliminary instruction by one of the resident staff especially appointed for the purpose.

The bag used by the Hospital to carry the articles needed at a confinement case in the tenements is opened and emptied before the students, and its contents severally described, together with the importance of cleanliness in their use. (See Fig. 1.)

SOCIETY OF THE LYING-IN HOSPITAL

OF THE CITY OF NEW YORK.

CONTENTS OF LABOR BAG.

Right Side of Bag.

ALCOHOL.
ERGOT.
ACETIC ACID.
SILVER NITRATE SOLUTION.
RUBBER CATHETER.
TAPE FOR CORD.

Left Side of Bag.

EYE WIPES in Boracic Acid.
DRY WIPES (Umbilical Dressings).
SOAP.
VASELINE.
BICHLORIDE TABLETS.
POWDERED STARCH.
C. C. PILLS.

Top Pocket.

SCALES.
NAIL BRUSH.
TAPE MEASURE.

Bottom Pocket.

THREE BASINS.

Centre of Bag.

STERILIZED VULVA PADS.
STERILIZED COTTON WIPES.
PELVIMETER.
OBSTETRICAL PAD.
DOUCHE BAG.
BOTTLE CONTAINING
TWO DOUCHE TUBES.
ONE GLASS CATHETER.

Left Cover of Bag.

SCISSORS.
EYE DROPPER.

Right Cover of Bag.

SIX REPORT BLANKS.
LABOR RECORD.
CHILD'S RECORD.
BIRTH CERTIFICATE.
APPLICATION CARD.
STUDENT'S PAD.

NOTE.

1.—Before leaving case, pupils must see that all of above articles are returned to bag.

2.—Jars containing vulva pads, cotton wipes and catheters, are not to be opened until required for use.

3.—All bottles, instruments, rubber apparatus, etc., must be wiped dry and free from blood stains before being returned to labor bag. Students will be held responsible for any damage to labor and postpartum bags resulting through uncleanliness or carelessness.

The same instruction is then given in the care and use of the bag used by the Hospital in visiting mothers and their children after confinement. (See Fig. 2.)

Society of the Lying-In Hospital

OF THE CITY OF NEW YORK.

CONTENTS OF POSTPARTUM BAGS.

Right Side of Bag. EYE WIPES IN BORACIC ACID. DRY WIPES (Umbilical Dressing).
Left Side of Bag. SOAP. BICHLORIDE TABLETS.
Upper Pocket. NAIL BRUSH. TAPE MEASURE.
Lower Pocket. STARCH. C. C. PILLS.
Centre of Bag. STERILIZED VULVA PADS. STERILIZED COTTON WIPES. BASIN.

NOTE.

1.—Before leaving case, pupils must see that above articles are returned to bag.

2.—Jars containing vulva pads, cotton wipes and catheters, are not to be opened until required for use.

3.—All bottles, instruments, rubber apparatus, etc., must be wiped dry and free from blood stains before being returned to labor bag. Students will be held responsible for any damage to labor and postpartum bags resulting through uncleanliness or carelessness.

At this time, as a preliminary to the later instruction, the general rules of asepsis and antisepsis are gone over with especial reference to the examining hand, and to these are added the general principles in the treatment of normal labor and the puerperal woman and her child.

The instructor then introduces the pupil to the history-room of the Hospital, produces a series of history blanks, and explains how, when,

Fig. 2.—Postpartum Bag.

(From a photograph.)

and where the observations called for upon the latter are to be recorded. (See History Blanks.)

A blank-book called the "Student's Record" is then given to the pupil (see below), in which he is instructed how to enter the (1) number of cases confined, (2) the number of cases at which he was present, (3) the number of antepartum examinations made, and (4) the number of post-partum visits made.

This Record is verified from time to time by the instructor, and later corrected by comparison with a general record-book of students' work kept by the Hospital.

STUDENT'S RECORD.

Name, _____ No. ____

Service began _____ 189 ____

" ended _____ 189 ____

DATE.	CONFINED CASES No.	PRESENT AT CASES No.	VISITED CASES No.	EXAMINED CASES - A. P. No.

B. The Examination of Pregnancy—Antepartum Instruction.

At the present time most of the antepartum instruction of this Institution is carried on in the main Hospital building, and this work continues through the student's two weeks' term of service. The instruction in the examination of pregnancy has been systematized during the past year by the Medical Board, so that each student examines and records the history of pregnancy on an average of 9.04 cases under competent and critical supervision.

The examining-rooms, three in number, are, during five afternoons of the week, under the charge of the Assistant Attending Physicians, who serve in rotation.

Patients applying for admission to the outdoor or ward service of the Hospital are subjected to a thorough examination, and unless the case be an emergency one, the services of the Hospital are refused unless the patient submit to such examination of pregnancy.

Under the supervision and criticism of the assistant attending physician on duty, students are required to make a thorough examination and diagnosis of pregnancy, including pelvimetry, and properly to fill out the History of Pregnancy.

The Medical Board has seen fit to make this record, as well as the subsequent history blanks of Labor and of the Child, fuller and more detailed in their requirements than perhaps the purely medical records of the Hospital would demand. This is done in order to bring out the student's faculties of observation, and a wider consideration of the subject than is generally considered necessary.

Moreover, this is the time we have selected to inculcate in the student the principles of obstetric cleanliness, mechanical and chemical. Soap, brushes, bowls of mercuric chloride, and an abundant and convenient water supply are to be found in the examining-rooms of the Institution. And under critical supervision, each student is required to carry out the same rigid cleaning and disinfecting of the hand and forearm in his examination of pregnancy as in the confinement cases.

It is the aim of the Medical Board to have these examinations of the dispensary women resemble as nearly as possible the "touch courses" of the foreign maternities. Two students, after a thorough cleaning of the hands, examine a case of pregnancy both externally and internally. The instructor in charge then examines the case, and questions the students regarding the general condition of the patient, the period of gestation, posture and presentation of the fœtus, condition of the mammary glands, anterior abdominal walls, external genitals, and pelvic contents, together with the size of the bony pelvis, and departures from the normal in the hard and soft parts.

Particular attention is at this time given, first, to the size of the pelvis; and, second, to the size of the fœtal head. Examinations thus carried out under the eye of the instructor, with attention to minute details, as well as

general observations in the examination and care of even a few cases of pregnancy, will prove of far greater advantage to the student than a much greater number of cases of pregnancy examined by him without direct instruction and supervision.

C. The Care of Labor Cases—Intrapartum Instruction.

The pupil's training in the care of women during labor is obtained during his junior week by acting as assistant to senior pupils when the latter are sent to cases of labor in the tenements, and in his senior week by himself taking charge and caring for the woman in labor, in turn assisted by another junior pupil, but always under the supervision and criticism of members of the resident Hospital staff.

Juniors, as well as seniors, during their term of service, are required to attend the obstetric clinics of the Hospital.

The junior pupil, early in his term of service, accompanies one of the senior pupils when the latter responds to a call from a labor case in the tenement district. At these calls the junior acts in the capacity of an assistant to the senior pupil, and the latter, in turn, as assistant to the one of the resident staff of the Hospital who visits the case immediately after the two pupils. It is under the supervision and criticism of this resident staff officer that the treatment of the case is carried out.

Although the Institution permits of confinements being carried out by the senior pupil, in normal uncomplicated cases, under supervision of the staff officer, still, as the rules which he has already read, and to which he has subscribed, state, the student is debarred from prescribing for any case, from performing any obstetric operation, interfering in malpresentations or positions, or even giving an intrauterine douche. All such questions as these are referred to the supervising staff officer, or, in his absence, directly to the Resident Physician at the Hospital, by means of the printed blank with which all labor bags are provided. In order that the Resident Physician may keep in touch with the progress of all cases in the outdoor service, both normal and abnormal, the accompanying printed blank has been made more comprehensive than would seem necessary, and the senior pupil is required to send in every two hours reports of the progress of his case to the Resident Physician. (See Blank on page 59.)

The junior pupil thus has the opportunity of witnessing the practical application of the rules governing his present and future conduct, in the first few days or hours of his service. He now sees the paraphernalia of the labor bag put into actual use. He arranges the bed in as cleanly a manner as possible; assists in securing the necessary hot water and in the preparation of the mercuric chloride solution for the hands and external genitals; cleanses his hands and forearm in the manner already taught at the Hospital; washes the patient's external genitals first with soap and water, and then with a sublimate solution, using the sterilized cotton contained in the labor bag; after further cleansing of his hands, follows the senior pupil in examining the patient internally, and is shown how to enter

his diagnosis upon the Labor Chart, as well as the number and time of his internal examinations, to which he is required to sign his name.

Here it will be well to describe the system by means of which the senior and junior pupils are assigned to cases of confinement, and the checks and supervision brought to bear upon them by the resident staff, so as to prevent accident and bring the case to a successful termination.

1. The two pupils first on call are summoned by the office clerk upon the receipt of the Hospital of a demand from one of its patients for medical attendance.

2. Proceeding to the office, they find awaiting them a labor bag (see Fig. 1), and the Antepartum History Blank of the case in question, upon which the patient's address is recorded.

3. Upon a blackboard provided for the purpose the pupils' names and destination are then written, and upon another board the number of the labor bag, so that record may be kept of the whereabouts of the pupil and the Hospital property.

4. Arriving at the patient's home, the bag is partly unpacked and arrangements made for the examination of pregnancy. The finger-nails are cleaned, and the hands and forearms of the pupils are washed and disinfected after the prescribed rules of the service. The junior pupil then adjusts the Kelly pad, washes the lower abdomen, upper thighs, and genitals of the patient, first with soap and water, and then with sublimate solution. Pupils are instructed at this time to expose the woman as little as possible. Patients, although tenement-house and charity ones, are treated with the same attention and consideration as those of private practice. The external examination of pregnancy is then made by both pupils, and by abdominal palpation the attempt is made to determine the presentation and position. The situation and rate of the fœtal heart are then noted and recorded.

5. The hands and forearms of the pupil are then scrubbed for three minutes with soft soap and nail-brush in hot water, and subsequently in a solution of corrosive sublimate, and the vaginal examination of pregnancy is made. As a routine, the pupil is required to make the following observations is this examination:

(1) Is pregnancy present?

(2) Is the woman in labor?

(3) What is the stage of labor?

(4) The condition of the os, size, dilatability.

(5) The position and presentation.

(6) The internal conjugate diameter.

(7) Any apparent disproportion between the presenting part and the size of the pelvis.

The pupil then ascertains the condition of the bowels, bladder, stomach (food), and, if necessary, shall see to the emptying of the two former.

The senior pupil is expected to instruct his junior in the minor details of the management of the first and third stages of labor, as, for instance, the care of the fundus uteri during these two stages.

6. The first report to the Resident Physician is at this time made out and dispatched by the husband of the patient, or one of the household, to the main Hospital building, or, if more convenient, to the sub-station in Broome Street; from there it is telephoned to the Hospital. A copy of this blank is herewith appended:

SOCIETY OF THE LYING-IN HOSPITAL OF THE CITY OF NEW YORK,

251 East 17th St., New York City.

When sending to the Hospital for assistance, students must in all cases use and fill out this blank.

New York, ... o'clock, ... M.

Patient's Name, ...

Address, ...

House, ... Floor, ... Room, ...

Number of Pregnancy, ...

Month of Gestation, ...

Duration of 1st Stage, ...

" 2d " .....

" 3d " .....

Pulse, ... Temp., ...

Fœtal Heart (frequency), ... position, ...

Fœtus by abdominal palpation, { Dorsal plane, ... Head, ... Small parts, ... Movements, ...

Presentation, ... Position, ...

Os uteri (size), ... condition, ...

Membranes, ...

Presenting part, { Above brim, ... Engaged, ... At outlet, ... On Perineum, ...

Character and frequency of labor pains, ...

.....

General conditions and remarks: .....

.....

.....

.....

.....

.....

.....

Attendant.

In ordinary uncomplicated cases these reports of the progress of the case are sent in at two-hour intervals. In primiparæ, a report is returnable when the os is fully dilated, and in all cases at the completion of the second and third stages of labor.

In complicated cases, or in the presence of sudden emergency, reports are dispatched as often as the necessities of the case may demand.

7. Following soon upon the departure of the students from the Hospital, the member of the resident staff first on regular turn visits the case, gives what instruction is necessary to the pupil, and, in many cases of primiparæ, takes charge of the birth of the head and shoulders.

At the completion of the second stage of labor, the fundus of the uterus is given over to the care of the junior pupil, while the senior gives his entire attention to the care of the new-born child.

The throat and eyes of the child are wiped out with the boracic wipes provided in the labor bag. (See Labor Bag.) It is the teaching of the Hospital that the eye should be wiped away from the nose, and that a separate wipe should be used for each eye.

Respiration in the child is now established, and unless there is some positive contra-indication, it is the custom of the Hospital not to tie the umbilical cord until the pulsations cease. The usual two ligatures are used in our services, and after division of the cord, the fœtal stump is carefully washed with mercuric chloride solution, and a dry occlusion dressing applied.

8. The third stage having been successfully completed, the senior pupil, assisted by the junior, administers a vaginal sublimate douche.

9. It then becomes the junior pupil's duty to hold the fundus uteri for one hour, carefully watching for dangerous relaxation.

10. In the meantime, the senior pupil weighs and measures the child, strips and dresses the cord. (See History of Child.)

11. The mother is then cleansed of blood, wet bedding removed, the abdominal bandage and vulva pad adjusted, and her pulse and temperature finally taken and recorded. (See Labor Chart.)

The labor bag is now repacked, each article being checked off from the printed list found on the cover, and the pupils return with it to the Hospital, and there the senior pupil makes his final report to the Resident Staff Officer of the condition of the patient when last seen.

The pupils' names are now erased from the blackboard in the office, and they become last on turn, awaiting an appointment to another case, and the receipt of the labor bag is recorded, with its number.

D. Treatment of Mother and Child after Confinement—Postpartum Instruction.

(*a*) *Outdoor or Dispensary Service.*

In the treatment of puerperal women and their children, as in the care of confinement cases, the Hospital utilizes the material of both outdoor and ward services for purposes of instruction.

In this Hospital the postpartum instruction given to graduate and undergraduate pupils occurs early in their hospital course. In both instances, the first postpartum calls are made in the company of a member of the resident staff who is expected to give systematic instruction in the work.

Arriving at the house of the patient, the pupil, under the critical supervision of the instructor, cleanses his hands and forearms according to the regulations of the Hospital.

Having brought with him the postpartum bag already illustrated and described, the pupil is instructed in the making of the necessary solution of sublimate.

While waiting for the tablet of mercuric chloride to dissolve, the aspect of the patient is noted, and record is made of the temperature, and the condition of the bowels, breasts, and bladder.

The hands of the pupil are again cleansed. With the exercise of the greatest care that his hands come in contact with absolutely nothing between the mercuric chloride solution and the vulva of the woman, the vulva pad is removed from the patient, the character of the lochial discharge upon it carefully noted, and the hands are a third time dipped in the mercuric chloride solution.

The genitals are then carefully washed with fresh mercuric chloride solution with the sterilized cotton provided in the postpartum bag, and a fresh vulva pad applied. (See Contents of Postpartum Bag.)

After this the height of the uterus above the symphysis, the sensitiveness and contractibility of the uterus, and the condition of the iliac fossæ are noted, and the abdominal binder reapplied.

The pulse of the patient is taken both at the beginning and at the end of the postpartum call.

It is customary at present for the pupils of the Hospital to carry notebooks in which are entered, by means of a rubber stamp, a copy of the diurnal observations, to be made at the postpartum visit, for mother and child. The pupils are required to copy these observations in ink, in their proper places on the history charts of Mother and Child upon the day of the observation.

The mother being attended to, the pupil directs his attention to the child. His hands are again scrubbed in the solution of mercuric chloride, and the umbilical cord of the child is dressed according to the prevailing custom of the Hospital.

The condition of the child's eyes, skin, bowels, and bladder are noted and entered on the history chart. Several postpartum calls, as they are termed, may thus be made in the course of a few hours. In such postpartum work the pupil acquires a knowledge of the daily changes in the lochia, any alteration in the stump of the umbilical cord, in the breasts, and other postpartum phenomena which is of quite as much value as the management of a case of normal labor.

Upon his return to the Hospital, the pupil is required to report the condition of his postpartum cases to the Resident Physician or his representative.

(*b*) *Indoor or Ward Practice.*

In April, 1895, systematic instruction in the care of the puerperal woman and her child was begun in the wards of the Hospital. Each week the junior pupils coming on duty are divided into three equal groups. Each group serves on ward duty for two days, and during this time is under the direct supervision of an assistant resident physician, who is detailed for ward duty. Each morning the group on duty meets the assistant on ward duty in the wards of the Hospital, and is given personal instruction in the care of the puerperal woman and her child. This instruction includes:

1. Observations on the general condition of the mother—her temperature, pulse, respirations, bowels, bladder, condition of breasts, diet, character of lochia, application of binder and vulva pad, asepsis and antisepsis, and any complication or abnormality that may be present.

2. Observations on the general condition of the child—its temperature, pulse, and respirations; condition of stools, bladder, mouth, nose, eyes, breasts; method of nursing, dressing of stump of cord, cleansing of mouth and eyes, and application of binder.

E. Obstetrical Clinics, Including Normal Labor and Obstetrical Surgery.

The equipment of the operating-room and amphitheatre of the Hospital allows of each normal and abnormal delivery, operation, or examination being made the occasion for an obstetric clinic.

The rules require that all staff officers, undergraduate and graduate pupils, and nurses shall be summoned to such clinics.

These clinics are conducted by the Attending Physician on duty, or one of the resident staff officers, and are made to take the nature of demonstrations. The steps of the examination, delivery, or operation are explained and enlarged upon by the lecturer, and in abnormal cases, postgraduate pupils are called down to the operating table to examine the case.

For these obstetric clinics to be properly carried out, it is necessary that the resident staff of the Hospital shall also be a teaching staff, and that a preliminary history of the case in such instances shall be concisely stated, as well as a careful exposition of each step of the labor or operative procedure.

It is the intention of the Medical Board that these clinics shall eventually resemble the diagnosis classes held abroad, as in Munich and Prague. In the maternities of these cities, parturient women are brought into the amphitheatre of the Hospital from the ward or delivery-room, and two students are called down from their seats and required to render their hands and forearms obstetrically clean in the presence and under the criticism of the instructor, examine the case, and make the diagnosis of pregnancy or labor, presentation, condition of the os, membranes, vagina, vulva, bladder, and, finally, undergo questioning from the instructor regarding their findings in the case.

Should operation or interference be called for, it is performed by the instructor; but should the case prove a normal one, the student will be permitted to complete the case, always under the criticism and supervision of the instructor, who shall be expected to address, not only the students at the case, but the entire audience.

Many points of practical interest connected with the management of the second and third stages of labor, the handling of the child, the care of its eyes, the administration of the postpartum douche, the watching of the fundus uteri, the application of the occlusion dressing and abdominal binder, may be dwelt upon in a most thorough as well as interesting manner.

Some idea of the scope of the clinical teaching in these obstetric clinics may be gathered from the following table, which indicates that from February 18, 1895, to April 1, 1896, two hundred and fifty-six (256) clinical lectures were delivered either by the attending, assistant attending, or resident physicians of the Hospital.

Table of Clinical Lectures Delivered up to April 1, 1896.

Number of Confinements from February 18, 1895, to April 1, 1896	256
Number of normal delivery	130
" premature births	45
" abortions	17
" forceps delivery	22
" versions	8
" accouchement forcé and version	7
" accouchement forcé	6
" craniotomy	3
" decapitation (Barnes's hook)	1
" symphysiotomy	1
" manual extraction of breech	16
Total	256

Special Graduate Instruction.

antepartum, intrapartum, postpartum, operative.

With the exception of certain privileges, the intrapartum instruction to graduates differs little from that given to the undergraduate pupil by the attending physicians and resident staff of the Hospital.

The same oversight, the same checks, the same supervision are brought to bear upon the work of the former as well as upon that of the latter. The general Hospital regulations apply to him. Cases are assigned to him in regular rotation with the undergraduate pupils, but with this privilege—that he may, at his own discretion, forfeit his turn. A case once assumed, however, must be carried to its completion. He sends in to the Resident

Physician the regular reports of the progress of the cases; he fills out, in sending in word of complications to the Hospital, the blank provided for that purpose, and is not allowed to interfere without permission of the resident or attending physicians.

The privileges tendered the graduate consist, first, in the fact that he may select his cases; and, secondly, he is permitted to perform such operations as the Attending Physician may assign him. He remains one month in the Hospital, and agrees to confine at least fifteen cases.

The Hospital offers two special courses of graduate instruction, as follows:

A. The Graduate Operative Course.

Physicians entering upon this course of instruction are expected to reside in the Hospital building, in separate apartments set apart for the purpose, and they shall during their term of service be subject to the Special Rules for Graduate Pupils, and also to the General Rules of the Hospital.

This course includes the care and delivery of normal cases, and the witnessing of all the operations performed in the service of the Hospital, and the performance of such obstetric operations by the pupil as the Director may assign to him, and each pupil shall receive at least one obstetric operation in each two weeks of his service.

Pupils in this course, in order to obtain the Certificate of the Institution, shall attend in confinement at least seven patients in each fortnight of the course, and they shall have the privilege of indicating to the Resident Physician the time when they desire such cases shall be assigned to them. But once having undertaken a case, they shall attend it until discharged from the service.

B. Graduate Diagnosis, or Touch Course.

Physicians taking this course do not reside in the Hospital building, but each afternoon receive instruction in the antepartum examining-room from the attending or assistant attending physician on duty.

In addition, members of this course are permitted to witness all operations performed in the service, and are permitted to examine such abnormal cases as require operation.

The fee for the above course of two weeks is $20.

THEORETICAL LECTURES.

Demonstrations.—Recitations.

Although the Medical Board requires that students shall have some theoretical knowledge of obstetrics before taking a course at this Hospital, a certain amount of theoretical instruction is combined with the practical instruction given in the clinics and at the bedside in the tenements. Obviously, in the short time that a student is at the Hospital, but a small part of the more important subjects can be taken up which it is possible to teach in a theoretical lecture. Realizing this, the Medical Board has been compelled to limit the subjects of theoretic instruction mainly to the management and mechanism of normal labor. These lectures are illustrated and made more practical by the ordinary aids to didactic teaching. Demonstrations on the blackboard, charts, and anatomical preparations, a metal pelvis which is mounted on a tripod, and the phantom of Schultze, are the aids which are constantly employed. Wax models showing the anatomy of the generative organs, embryological models, and wet specimens, and a series of deformed pelves serve to illustrate the special lectures which are given by the attending physicians whenever cases of special interest occur in the service of the Hospital.

It is believed that more practical good can be accomplished by didactic lectures which have a direct bearing on the work in hand, than by any lecture following a routine, and which must be repeated from week to week as each new set of students come on duty. In short, theoretic instruction should precede and follow the instruction given during the student's Hospital course, when he is gaining that practical experience and self-reliance which only come from observation, and by the personal examination and care of women during pregnancy, childbirth, and the puerperium.

Theoretic instruction by didactic lectures is given under the supervision of the Medical Board by the attending physician on active duty, and by the attending physician on septic duty. The Board of Assistant Attending Physicians has charge of the recitations, the assistant on regular duty reviewing the subject matter of the regular lectures and the work in the antepartum rooms. Instruction is also given by the house staff. This part of the work, however, comprises instruction in the outdoor service, and is described elsewhere.

The lecture given by the attending physician is called the regular

lecture, and is delivered early in the course. The ground covered by this lecture is summarized as follows:

1. *Introductory.*—A short explanation of the printed rules. The necessity of discipline in Hospital work, and the conduct to be observed in the presence of patients. The rules which govern the student in the Hospital are read by each man before beginning his service, and are appended here.

Rules for Undergraduate Pupils.

1. Each pupil shall, before going on duty, pay to the Chief Clerk the prescribed fee, and will, in return, receive a receipt which will entitle him to reside at the Hospital and receive the regular instruction for the period of two weeks. Students or graduates wishing to remain a longer or a shorter period of time will be allowed to make special contracts, subject to the approval of the Medical Board.

2. Any pupil wishing to leave the Hospital before his allotted term of service has expired, must notify the Director at least forty-eight hours before leaving.

3. Any pupil may be denied the use of the Hospital at the discretion of the Director.

4. All pupils shall be under the direct control of the House Physician.

5. No pupil shall be absent from the Hospital all night, except in the discharge of his duty. Pupils shall board in the neighborhood at their own expense. They shall report to the medical clerk upon going to meals and upon returning.

6. Pupils shall be assigned cases in regular rotation. If the pupil on turn be out in the duty of the Hospital when a case comes in, he shall lose the case, but he shall not lose his turn. If, however, he be absent on his own pleasure, he shall lose both the case and his turn. A case thus transferred goes to the pupil next in the order of rotation.

7. No pupil shall be present at any labor not falling to him in turn, except in the case of operations, and only in such cases as the Director shall permit.

8. Each pupil shall visit twice daily, or oftener if necessary, post-partum cases assigned to him, and also such other cases as the House Physician shall direct. He shall, at these visits, observe the strictest antisepsis, and shall report after each visit the patient's condition to the assistant resident physician on septic and history duty, or in his absence to the medical clerk.

9. All pupils, on returning from a case, shall immediately make the entry of their notes upon the proper blanks provided by the Hospital.

10. No pupil, while in performance of his duties, shall advise or prescribe for any patient who may apply to him.

11. No pupil shall perform any obstetric operation, nor interfere with any mal-presentation, nor give an intrauterine douche. If he deem such interference necessary, he shall send immediately to the Hospital for assistance.

12. Pupils shall be furnished by the Hospital with clinical thermometers, tape measures, locker keys, and stethoscopes on receipt of the prescribed deposit. Pupils shall be responsible for the return of these articles in good condition.

13. Pupils, when sending to the Hospital for help, shall invariably fill out the blanks provided for that purpose, being particular to note the time and reason for sending.

14. Pupils shall, at the discretion of the Director, be isolated from attending normal cases of labor, to attend any septic case that may arise.

15. No pupil shall receive personal remuneration from a patient under any circumstances.

16. Each pupil shall, before going on duty, deposit with the Chief Clerk the sum of ten dollars as security for the cost of keys, thermometer, tape measure and stethoscope, and as a guarantee that he will serve his full fourteen days. This deposit will be forfeited in case the pupil leaves or is dismissed before the end of his full term of service. Any pupil may be dismissed by the Director, subject to the approval of the Medical Board.

17. Pupils shall serve for a term of two weeks from 9 o'clock in the morning on the date of appointment until 12 o'clock noon on the fifteenth day thereafter, or until they shall have made, reported, and recorded their postpartum calls for that day.

18. Each pupil at the termination of his service, provided he shall have performed his duties faithfully, and for the full time of his appointment, to the satisfaction of the Medical Board and of the Governors, may receive from them a certificate thereof.

2. *The Examination of Pregnant Women.*—The methods of examination are taken up and described with the aid of the Pregnancy Sheet, which is printed in connection with the description of the methods of keeping statistics. Students are taught to make observations and to record them systematically. The ordinary symptoms of pregnancy, the suppression of menses, date of quickening, and the methods of calculating the probable date of confinement are discussed.

3. *The Management of Labor* is described, using the charts as a guide. The methods of diagnosis of presentation and position, particularly by abdominal palpation; the diagnosis of the existence of labor and the mechanism of normal labor are referred to; it being, however, supposed that the student has some previous knowledge of this part of the subject.

The division of labor into stages having been explained, the management of each stage is in turn taken up and described. The greater part of the time is used in the explanation of the principles of preserving the perineum from rupture and illustrating these on the phantom. The proper management of the placental stage is minutely described, and, finally, the care of the mother and child subsequent to labor. The manual pressure on the uterus as a guard against postpartum hæmorrhage, the application of the binder, the cleansing of the child's eyes and mouth, and the ordinary methods of establishing respiration, all form a part of the lecture.

4. *The Ordinary Complications* of normal labor are referred to, and the printed sheet used in sending for assistance is shown.

(*a*) Delayed labor, with its causes, in the various stages;

(*b*) Retained placenta or membranes;

(*c*) Lacerations of the genital tract; and

(*d*) Hæmorrhage, are each taken and described.

Excepting in the case of hæmorrhage, treatment is not touched upon, the directions being that the student send at once to the Hospital for assistance. In the case of hæmorrhage, and while waiting for assistance, the use of the douche and the other methods of securing contraction of the uterus are explained.

5. *Postpartum Visits and the Daily Records of Mother and Child.*—The routine treatment and observations to be made at these visits are taken up in connection with the history charts.

6. *Demonstrations of Abnormalities or Operations of the Past Week.*—This forms a very important and constantly varying part of the lecture, and covers, from time to time, almost the whole subject of dystocia and obstetric surgery. On the phantom, versions or forceps operations are repeated, the indications for operating explained, and the technique illustrated. It may be added that at the conclusion of this, the regular lecture, the students are encouraged to ask questions, thus bringing the lecturer more closely in touch with the class.

The Septic Lectures.

On the following day, or as soon after the regular lecture as possible, a lecture is given by the septic attending physician. This lecture is also didactic, and may be summarized as follows:

1. Antisepsis in labor.
   - *a*. Sterilization of the hands and forearms.
   - *b*. Sterilization of the patient.
   - *c*. Sterilization of the dressings and everything which may be brought in contact with the patient.
2. The nature and causes of puerperal fever. The ordinary sources through which a patient may be infected, and the prevention.
3. The classification of puerperal fever.
4. Symptomatology and diagnosis of the various forms.
5. The treatment of puerperal fever.
   - *a*. Use of the douche.
   - *b*. Use of the curette.
   - *c*. Various operations.
6. Fever due to causes other than infection.
   - *a*. From the digestive tract. Care of the bowels, and use of cathartics.
   - *b*. Care of the breasts.
   - *c*. Other complications, causing rise in temperature.

7. The necessity of antisepsis during the puerperium. Vulva dressings.
8. The necessity of cleanliness and antisepsis in nursing.
   a. Care of the nipples.
   b. Care of the child's mouth.
9. Abnormalities of the breasts.
   a. Flat or deformed nipples.
   b. Eroded, fissured, and cracked nipples.
   c. Painful distention, and so-called caked breasts.
   d. Mammary abscess.
10. The necessity of antisepsis in dressing the umbilical cord.
   a. Disinfection of the cord, and materials for antiseptic dressings.
   b. Separation of the cord, and dressings for the stump.
   c. Purulent umbilicus: its treatment, and sepsis in the child (fever).
   d. Icterus in the child.
11. The necessity of antisepsis in the care of the child's eyes.
   a. Credé's method of using nitrate of silver.
   b. Frequent washings with boracic acid.
   c. Ophthalmia neonatorum: its causes, symptoms, and treatment.

The regular and septic lectures comprise all the didactic teaching given by the Medical Board. Although the lecture is theoretic, it is based each week mainly upon clinical grounds, having for its prominent subject cases which have actually been seen by the students.

Recitations.

Toward the end of the student's first week of service, a recitation is held by the assistant attending physician on duty. As has already been stated, these recitations are based upon the subjects of the regular and septic lectures. They include, also, questions upon the antepartum work and outdoor work. Even at the risk of needless repetition, a synopsis of the recitation is also made.

1. Antepartum work.
   a. Signs of pregnancy.
   b. Methods of physical examination.
   c. Diagnosis of presentation and position.
2. Labor.
   a. Diagnosis.
   b. Mechanism of vertex cases.
   c. Management of the three stages.
3. Postpartum work.
   a. Dressings and the care of mother.
   b. Visits, temperature, pulse, etc.
   c. Care of child.

4. Complications.
   a. In pregnancy.
   b. In labor.
   c. In the puerperium.
5. Sepsis and antisepsis.

Finally, it will be seen, that although the student is supposed to be familiar with obstetrics to a certain extent, still a large part of the theory is taught by this method; the lectures and recitations serving as a review, so that, in the practical experience that is acquired by a course in the Hospital, the theoretical part of the subject is kept constantly in mind.

THE INSTRUCTION OF NURSES.

It has seemed to the Medical Board of this Hospital that the system of instruction as carried out in the Nurses' Training Schools, with which we are sufficiently familiar to make it proper for us to judge, was susceptible of improvement in certain particulars. Without assuming to criticize the methods adopted by any school, we believe that the error has been committed of teaching the nurse too much theoretical medicine. Lecturers and classroom instructors in training schools seem to look upon the pupil nurse much as they look upon the medical student. Their lectures and their questions differ little from those adapted to the medical student in the early years of his study. Why should they insist that the nurse, whose knowledge of physiology, anatomy, and materia medica is quite elementary, should learn pathology, symptomatology, and treatment of disease with as much accuracy and in as much detail as the medical student? Would it not be wiser to teach nurses just enough of the theoretical parts of the subjects upon which they are working to make it possible for them to do their work intelligently?

Moreover, nurses are often forced to do so much arduous manual labor in the course of their daily work, that they are in no condition of mind or body to study during the time when their ward work does not occupy their attention. If, therefore, it is deemed wise to require nurses, in addition to their trying bedside work, to do much of the work of an orderly, they should not also be expected to commit to memory medical facts which are almost unintelligible to them.

It is to be remembered that this Hospital does not maintain a nurses' training school. It simply furnishes obstetric training to the nurses of other hospitals. In so far, however, as it is possible, in this limited field, it has been the aim of the Board to embody its ideas on the subject of nurses' training in the course herein described. It has attempted to limit the theoretical teaching of its nurses, as indicated above, and to make it possible for them to do whatever studying may be necessary, without overtaxing both mind and body. At present the bedside work of the nurses is limited to the indoor service of the Hospital. It is hoped at some future time to utilize the outdoor service as well, but as yet no feasible plan has been devised. The nurses of the Hospital are derived from two sources: the Training Schools of St. Vincent's Hospital in this city and of St. Mary's

Hospital in Brooklyn. These nurses come to the Hospital in the latter part of their course of training for a period of three months.

The nursing department of the Hospital is in charge of the Chief Nurse and her Assistant. The Chief Nurse is in absolute control of her department, both as to the disposition of the work among her nurses, and as to matters of discipline, and she is responsible and answerable to the Medical Board only. The course of instruction may be outlined as follows:

1. Theoretical:
   Lectures.
   Classroom recitations.
2. Practical:
   Outdoor Department—Laboratory.
   Outdoor Department—Obstetrical examinations.
   Indoor Department—Ward work.
   Indoor Department—Operating-room.

1. *Lectures.*—This part of the instruction has been deputed by the Medical Board to the Assistant Attending Physicians. The lectures extend over a period of two months, and are delivered weekly by the assistant attending physician on duty.

Outline of Lectures to Nurses.

1. Gross Anatomy and Physiology.
2. Pregnancy, signs: labor, mechanism, presentation, phenomena.
3. Cleanliness, sepsis, bacteriology.
4. Application of cleanliness: methods.
5. Preparation.
6. Care of woman, antepartum and postpartum.
7. Care of child.
8. Emergencies; relation of nurse to doctor.

LECTURE 1.

Gross Anatomy
of Female Pelvis.
Genitalia and pelvis.
False and true.
Brim and outlet.
Bones.
Soft Parts.
Urethra, bladder, ureters, kidneys.
Rectum.
Vagina, uterus, tubes, ovaries.
Vulva, clitoris, meatus, ostium vaginæ.
Anus.
Perineum.
Abdomen.

Gross Physiology
of Female Genitalia.
Puberty and menopause, menstruation.
Ovulation.
Impregnation and development of fœtus.
Parturition, abortion.
Puerperium.
Urinary system; excretory.
Gastro-intestinal; alimentary and excretory.

LECTURE II.

Pregnancy.
Signs.
a. Subjective.
b. Objective.
Mechanism.
Signs of beginning labor.
First stage: dilation of cervix.
Character of pains.
Second stage: expulsion of child.
Character of pains.
Third stage: expulsion of placenta.
Presentation.
Vertex.
Breech.
Shoulder.
Prolapse of umbilical cord.
" " Arm and hand.
" " Leg and foot.

LECTURE III.

Cleanliness.
Importance.
Asepsis and antisepsis.
Auto-infection (?) and ex-infection.
Origin.
Clothing, skin, catheter, rectum.
Patient's hands, physician's hands, nurse's hands.
Bedpans, daily dressings, neighboring erysipelas, pneumonia, sore throat, child's eyes and navel.
Bacteriology.
Staphylococci.
Streptococci.
Gonococci.
Colon bacilli.
Immunity.

LECTURE IV.

Principles and Application
of cleanliness to
(*a*) Instruments and apparatus.
Dressings, vulva pads, bandages, etc.
Bed clothing.
Dress of nurse and physician.
(*b*) Nurse and physician.
Disinfection: hands, nails.
Care of hands.
Vaginal examination.
Use of vaseline.
Method of introducing finger.
External examination.
Methods of securing asepsis in private houses in
(*a*) City, with conveniences.
(*b*) Country, with no conveniences; old linen, wash boiler.

LECTURE V.

Preparation for Labor.
Body.
Attention to bladder, rectum, nervousness, feeding, clothing, baths, flannel drawers, hair braided.
Bed and Room.
Temperature of room, seventy-three degrees or more.
Room cleansed and plain.
Hair mattress preferred.
Narrow bed.
Rubber sheeting, absorbent pad.
Old quilt, sheets in plenty, old blanket, sterilized.
Sheet fastened to foot of bed to grasp.
Preparation of supplies.
Preparation of nurse.
Toward household, doctor, and patient.
Removal of placenta and blood.

LECTURE VI.

Care of Woman.
Antepartum.
Bowels, bladder.
Comfort; varicosities, pendulous abdomen or breasts, breathing.
Feeding.
Allay nervousness.
Watch for mental changes; mania, melancholia, headache, blindness, œdema, vomiting, urine.

During Labor.
That patient is not exposed.
Catching cold.
Is clean.
Postpartum.
Catheterization.
Urine: relaxation, hæmorrhage.
After pains.
Lactation, feeding.
Pulse, temperature, breathing.
Caked breasts, fissured nipples.
Constipation.
Fever, douches.
Involution and lying in bed.

LECTURE VII.

Care of Child.
Washing.
Vernix caseosa.
Oil, soap, sponge, temperature of bath, baby powder, frequency.
Clothing.
Cloths for navel.
Binder, flannel slips, napkins, etc., stockings.
Feeding.
Size of child's stomach, frequency.
Weigh weekly.
Sleep.
Surrounding temperature.
Cry.
Normal injuries during delivery.
Shape of head, cephalhæmatoma.
Discolored face.
Observe:
Genitals, anus, and deformities, cleft palate, hare lip, tongue-tie, talipes.
Eyes.
Ophthalmia.
Mouth.
Thrush.
Vomiting, colic, diarrhœa, constipation, descent of bowels, worms.
Retention of urine and fæces, incontinence.
Bleeding from the navel, from bowel.
Icterus (no change in urine or fæces or eyes).
Nævi and eruptions, burns and scalds.
Atelectasis.
Swelling of breasts.
Convulsions.

Care of Child.
Icterus (no change in urine or fæces or eyes).
Bruises, sprains, fractures, cuts.
Stings of insects, foreign bodies in eyes, ears, nose, and throat.
Bleeding from nose, earache, fever.
Premature children.

LECTURE VIII.

Emergencies.
Delivery if doctor does not arrive.
Holding back head and delaying labor until arrival of doctor.
Antepartum.
Nephritis, eclampsia, mania, hæmorrhage, placenta prævia.
Abortion or miscarriage.
At Labor.
Operations, perineorraphy, etc.
Hæmorrhage.
Prolapse of cord.
Postpartum.
Hæmorrhage.
After pains.
Mania.
Caked breasts and abscesses.
Fever.
Sickness of mother or child.
Tact in calling doctor.
Relation of nurse to doctor and to patient and to patient's household.

Classroom Work.—The classroom work is carried on by the chief nurse. She holds recitations weekly upon subjects prescribed by the Medical Board. These subjects have reference to the lectures of the assistant attending physician and to the ward work of the nurses. In the instruction of the nurses, as well as of students, it is the purpose of the Board to confine the attention of their pupils to their practical work as a source of study rather than to text-books.

II. *Outdoor Department.*—(*a*) *Laboratory Work.*—The work under this heading consists in the preparation and care of the material and paraphernalia in use in the outdoor department of the Hospital, and it is the first work to which the nurse is assigned. Two nurses are on duty at the same time in this room, and the term of service is two weeks. Practically all of the work is done during the day hours, so that these nurses are rarely called at night.

The following is an outline of their work in this department:

Postpartum and Labor Bags.—Every case of labor in the outdoor service necessitates the use of a labor bag, and every student in the Hospital uses two postpartum bags daily in making his calls. In addition the

staff make use of a considerable number of bags in the course of their work. It is the duty of the nurses to clean and fill these bags after their return from service in the tenements. To facilitate the work, a list of articles which should be found in each bag is pasted on the inside of the cover. These lists can be found in the portion of this article treating of the subject of practical instruction to students, and a perusal of their contents will convey a better idea of the practical value of this work.

Vulva Dressings.—The nurses are also obliged to prepare, with the aid of helpers, all the dressings in use in the out-patient department. The heavy work of the laboratory, such as cutting the gauze and cotton for the vulva pads, is done by an orderly. These dressings are then enclosed in copper receptacles having perforated caps at both ends, and sterilized.

Instruments.—All instruments in use in this department are cleaned, sterilized, and again prepared for service by the nurses. It will thus be seen that everything having to do with the preparation and care of the material and paraphernalia of the labor and postpartum rooms becomes familiar to the nurse before her admission to the wards and operating-room.

(*b*) *Obstetrical Examinations.*—During their period of service in the laboratory of the outdoor department, the nurses are required to spend as much time as may be necessary daily, except Sunday, in the examining-rooms. They are here under the supervision of the assistant to the chief nurse and one of the assistant attending physicians. They learn the manner of preparing a patient for an antepartum examination, and the manner of conducting the examination easily and with as little annoyance as possible to both patient and physician.

Indoor Department.— Ward Work.—Each nurse is on day duty for four consecutive weeks, and on night duty for four weeks. The day nurses relieve the night nurses at seven o'clock in the morning, and are relieved by the night nurses at seven o'clock in the evening.

Briefly rehearsed, the ward work consists in noting pulse and temperature; in performing the necessary daily dressings of breasts and genitals, including the application of the binders to both breasts and abdomen; in administering food and medication; in the bathing and dressing of the infant, and its application to the breast; in noting, for purpose of report, the character of the lochia, the stools and the breasts of the mother, and the skin, mouth, umbilicus, eyes, and stools of the child. They are also taught methods of stuping breasts and abdomen, the administration of the vaginal douche, and the use of the catheter in postpartum women. Incidentally, they have considerable practice in keeping obstetric records according to fixed forms.

The nurses are present at rounds in the morning, and hear the clinical teaching of the medical officer in charge of the instruction of the students. In the course of her ward service, a nurse may at any time be isolated for the care of a septic case, or detailed for special service upon some operative case of unusually serious character.

Operating-room Work.—The Hospital at present has no special corps

of operating-room nurses, and, therefore, this work is included in the ward service.

The operating-room is in use daily for the purpose of normal deliveries, at which one or more nurses are in constant attendance. Apart from her own work at this time, the nurse hears the instruction given to the students, and she must necessarily obtain valuable information therefrom. Each labor is the subject of a continual clinical lecture, and quite often these lectures are given by the attending and assistant attending physicians.

In the absence of both the attending physician and his assistant, it is the duty of the house physician, or the member of the staff on ward duty, to give this instruction.

Here she is trained in her duties as an assistant to the accoucheur during normal labor and during operative procedures, and sees constantly the administration of chloroform and ether.

Methods of making vaginal examinations are taught during the first and second stages of labor, so that the nurse is competent to give an intelligent and reliable report of the condition of the cervix and the membranes, and of the position of the presenting part relative to the perineum. She learns also how to "strip" and tie the umbilical cord, and care for the new-born infant, as well as methods of resuscitation of an asphyxiated child. The manner of holding the uterus through the abdominal wall before and after the expulsion of the placenta is also explained. In short, every procedure which is carried on in the delivery-room becomes thoroughly familiar.

It is also to be remembered that many of the most serious operative cases of the outdoor service are brought to this room for operation, making the operative service unusually large. The rule in such cases is that all the nurses not on duty are summoned to the operating-room to witness major operations. During the course of an operation, the nurses on duty in the operating-room have certain specific duties assigned to them under the charge of the assistant to the chief nurse. By rotating the nurses from one set of duties to another in the operating-room, they become familiar with every phase of the work of preparation and assistance. Each nurse, also, during her ward service, has sole charge of the delivery-room during a certain number of normal deliveries. She thus learns by constant practice the actual performance of the nurse's duties in the lying-in room, both in normal and operative cases; and, finally, while in charge of the operating-room she assumes the responsibilities of an important position which she must fill afterwards in private practice, while she is still under supervision, and where her errors can be pointed out and remedied.

It would seem that such a course of training, conscientiously administered, would give the nurse a thorough preparation for her obstetric work.

STATISTICAL SYNOPSIS.

By H. McM. Painter, M.D.

The following statistical report covers a period of six years and three months, from the foundation of the Midwifery Dispensary to April 1, 1896. It will be noted that the cases of the *outdoor department only* are included in this report.

The disparity which will be noticed under all headings between the number of cases in the service, 10,233, and the number of observations recorded, is explained by the fact that in a service of this character there are many cases in which it is impossible to obtain the desired information; in some cases there is no record to be made; *e.g.*, presentation, sex, placenta, etc., in cases of abortion; etc.

Applications	12,802	
Confinements	10,233	
Living children		9,457
Still births		359
Abortions		417
		10,233

Nativity.

United States	910	Palestine	1
Germany	422	Bohemia	2
Russia	6,885	Wales	1
Poland	257	Arabia	2
Ireland	342	Canada	6
England	123	France	2
Austria	751	Nova Scotia	1
Roumania	138	Finland	2
Hungary	174	Turkey	2
Scotland	10	Australia	1
Holland	4	Sweden	6
Switzerland	9	Armenia	1
Italy	22	Unknown	159
Egypt	1		
Isle of Jersey	1	Total	10,233

Civil Condition.

Married	10,182
Single	8
Widowed	12
Unknown	31
Total	10,233

Age.

15–20 years	943	40–45 years	104
20–25 "	3,670	45–50 "	13
25–30 "	3,088	50–55 "	1
30–35 "	1,485	Unknown	98
35–40 "	821	Total	10,233

Para.

	Cases.		Cases.
I. para	2,157	XI. para	79
II. "	1,901	XII. "	70
III. "	1,566	XIII. "	38
IV. "	1,228	XIV. "	16
V. "	939	XV. "	8
VI. "	724	XVII. "	1
VII. "	557	XX. "	1
VIII. "	389	Unknown	139
IX. "	249	Total	10,233
X. "	171		

Presentation.

In the 10,233 cases it was possible to observe the presentation in 8,969 cases.

Presentation.	No. of Cases.	Ratio.	Children.		Died during the Puerperium.
			Living.	Still-born.	
Vertex	8,495	1 in 1.05	8,284	211	149
Breech	341	1 in 26.30	255	86	35
Shoulder	91	1 in 98.56	67	24	2
Face	36	1 in 249.13	33	3	3
Brow	4	1 in 2242.25	4	0	0
Ear	2	1 in 4484.50	1	1	0
	8,969	.....	8,644	325	189
Presentation not observed	847	.....	813	34	25
Abortions	417	.....	.....	....	....
Total	10,233	.....	9,457	359	214

Displacement of Fœtal Parts.

With regard to the following table, it must be stated that only those cases are included in which the displacement occurred spontaneously. If the extremities or the funis became displaced during some manipulation or operative procedure, such cases are not recorded in this table.

"Extension" of upper or lower extremity signifies a displacement upward. The meaning of "prolapse" is obvious. This explanation is given because the terms may be misleading, inasmuch as a prolapsed arm may be an extended arm, etc. We adhere to these terms, however, in this respect, as they are in common use. In the 10,233 cases reported, there were 242 early abortions. The cases here tabulated may, therefore, be said to have occurred in 9,991 cases of labor.

	Cases.
Upper extremity:	
Prolapse	72
Extension	23
Lower extremity:	
Prolapse	14
Extension	16
Funis—Prolapse	106
Placenta Prævia	31

Presentation in Cases of Displacement of Fœtal Parts.

In the cases of prolapse of the upper extremity, the presentation was as follows:

	Cases.
Vertex presentation	35
Breech "	1
Shoulder "	36
Total	72

Twins, 8 cases.

In the cases of extension of the upper extremity, the presentation was as follows:

	Cases.
Vertex presentation	1
Breech "	21
Shoulder "	1
Total	23

Twins, 2 cases.

In the cases of prolapse of the lower extremity, the presentation was as follows:

	Cases.
Vertex presentation	1
Breech "	10
Shoulder "	3
Total	14

In the cases of extension of the lower extremity, the presentation was as follows:

	Cases.
Breech presentation	11
Shoulder "	5
Total	16

Twins, 1 case.

In the cases of prolapse of the funis, the presentation was as follows:

	Cases.
Vertex presentation	61
Breech "	20
Shoulder "	24
Face "	1
Total	106

Twins, 10 cases.

Sex of Child.

In the 10,233 cases, the sex was observed in 9,661 cases.

	Cases.
Male	5,088
Female	4,573
Total	9,661

Delivery of Placenta.

9,034 observations.	Cases.
Natural forces	1,517
Expression	7,335
Manual extraction	182
Total	9,034

Implantation of Cord.

9,305 observations.	Cases.
Central	5,232
Lateral	3,622
Marginal	447
Velamentous	4
Total	9,305

Condition of Placenta.

9,670 observations.

	Cases.		Cases.
Normal	8,127	Cystic	30
Calcareous	749	Fibrous	290
Succenturiata	24	Fatty	420
Apoplectic	30	Total	9,670

Temperature of Mother (one hour after labor).

8,948 observations.

	Cases.		Cases.
95½°– 96½°	15	100½°–101½°	90
96½°– 97½°	109	101½°–102½°	14
97½°– 98½°	3,027	102½°–103½°	3
98½°– 99½°	4,905	103½°–104½°	2
99½°–100½°	783		
		Total	8,948

Pulse of Mother (one hour after labor).

9,107 observations.

	Cases.		Cases.
30–40	2	90–100	599
40–50	25	100–110	141
50–60	415	110–120	84
60–70	1,824	120–130	18
70–80	3,874	130–140	7
80–90	2,118		
		Total	9,107

Vaginal Examinations.

First Stage.

	Cases.		Cases.
1	327	6	654
2	1,222	7	359
3	1,071	8	261
4	1,199	9	122
5	714	10 and over	396

These examinations were made by:

	Cases.		Cases.
Pupils of the Hospital	5,109	House Staff	1,907
Midwives	9		

Second Stage.

	Cases.		Cases.
1	1,269	6	438
2	2,098	7	179
3	1,224	8	162
4	972	9	80
5	467	10 and over	137

These examinations were made by:

	Cases.		Cases.
Pupils of the Hospital	5,843	House Staff	1,912
Midwives	19		

Weight of Child at Birth.

9,389 observations.

	Cases.		Cases.
1–2 lbs.	9	9–10 lbs.	1,052
2–3 "	22	10–11 "	346
3–4 "	81	11–12 "	128
4–5 "	153	12–13 "	27
5–6 "	452	13–14 "	7
6–7 "	1,355	14–15 "	3
7–8 "	3,440		
8–9 "	2,314	Total	9,389

Temperature of Child at Birth.

6,960 observations.

	Cases.		Cases.
96°– 97°	777	100°–101°	312
97°– 98°	1,596	101°–102°	34
98°– 99°	2,703		
99°–100°	1,538	Total	6,960

Temperature of Mother during the Puerperium.

A.M.

Day.	96½° to 97½°	97½° to 98½°	98½° to 99½°	99½° to 100½°	100½° to 101½°	101½° to 102½°	102½° to 103½°	103½° to 104½°	104½° to 105½°	Number of Cases Observed.
Labor.	37	871	1,740	291	26	6	2	3	..	2,976
1st ...	106	3,867	4,148	394	57	34	11	5	..	8,622
2d ...	106	3,709	4,244	387	64	33	16	6	1	8,566
3d ...	70	3,493	4,292	482	97	38	20	10	8	8,510
4th...	62	3,264	4,076	472	77	56	22	13	70	8,112
5th...	69	3,338	3,968	431	88	35	22	4	..	7,955
6th...	57	3,045	3,618	362	96	43	24	5	..	7,250
7th...	50	2,605	2,958	337	53	38	24	6	..	6,071
8th...	37	2,306	2,453	249	36	23	15	6	3	5,128
9th...	46	1,531	1,563	133	28	19	14	6	3	3,343
P.M.										
Labor.	44	1,136	2,516	683	83	19	2	..	..	4,483
1st ...	86	2,937	3,726	476	84	28	19	4	3	7,363
2d ...	54	2,186	3,088	486	101	42	16	4	1	5,978
3d ...	44	1,715	2,537	544	87	51	31	12	1	5,022
4th...	29	1,277	2,033	358	102	50	25	6	1	3,881
5th...	24	1,158	1,841	305	70	41	26	10	4	3,479
6th...	19	709	930	183	57	31	22	8	5	1,964
7th...	16	553	629	146	48	22	15	12	3	1,444
8th...	19	398	509	90	31	28	18	8	4	1,105
9th...	3	236	318	70	23	13	13	7	2	685

Pulse of Mother during the Puerperium.

A.M.

Day.	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to 110	110 to 120	120 to 130	130 to 140	Number of Cases Observed.
Labor.	150	604	1,322	642	523	134	46	8	1	3,430
1st ...	399	1,785	4,048	1,767	501	114	48	16	6	8,684
2d ...	256	1,419	4,100	2,029	559	157	49	14	6	8,589
3d ...	166	1,232	4,075	2,218	677	153	60	1	1	8,583
4th...	185	1,230	3,965	1,932	609	121	68	9	3	8,122
5th...	209	1,271	3,953	1,775	517	139	42	9	3	7,918
6th...	240	1,243	3,692	1,536	418	91	32	11	2	7,265
7th...	140	859	3,017	1,370	433	100	45	8	3	5,975
8th...	132	803	2,617	1,116	314	95	28	9	2	5,116
9th...	91	498	2,072	777	183	55	14	6	..	3,696

P.M.

Labor.	257	924	1,856	970	284	75	34	7	4	4,411
1st ...	316	1,365	3,314	1,681	416	115	30	17	10	7,264
2d ...	164	909	2,658	1,563	473	139	66	19	3	5,994
3d ...	128	676	2,184	1,398	424	129	69	18	5	5,031
4th...	91	592	1,683	1,044	317	98	53	16	14	3,908
5th...	91	572	1,625	828	223	69	38	12	7	3,465
6th...	69	340	878	437	150	47	35	14	32	2,002
7th...	26	184	608	326	121	51	22	7	2	1,347
8th...	22	118	474	275	110	62	15	5	2	1,083
9th...	21	90	296	156	75	23	8	1	3	673

An Analysis of Cases of Vertex Presentation.

Total number of cases of vertex presentation	8,495
Number of mothers who survived	8,466
" " " died *	29
Number of children born alive	8,284
" " still-born	211
" " dying during puerperium	149

* Among the 29 cases are four cases of women with twin children, one of which was a breech presentation. These four women, therefore, appear again as mothers who died, in the corresponding entry under Analysis of Breech Presentation.

Moreover, there are four cases of death of mothers which were confined by midwives, the presentations of which are unknown to the Hospital.

Day of Death of Mothers.

5	mothers died on	Labor day
7	" "	1st day postpartum.
4	" "	2d " "
2	" "	4th " "
3	" "	6th " "
2	" "	7th " "
1	mother "	10th " "
1	" "	11th " "
1	" "	22d " "
1	" "	25th " "
1	" "	an unknown day in Bellevue Hospital.
1	" "	an unknown day after the 27th day postpartum in Bellevue Hospital.
29		

Cause of Death of Mothers in Cases of Vertex Presentation.

(See list of Fatal Cases, C. N. 161; 420; 1,016; 1,198; 1,425; 1,547; 1,723; 2,381; 2,429; 3,267; 3,314; 3,351; 3,564; 4,655, twins; 4,683; 4,726; 5,190; 5,473; 5,633; 5,708; 5,799; 6,235; 6,925; 7,070; 7,263; 7,538; 8,034; 10,047; 10,218, twins.)

	Cases.
Acute Nephritis; œdema of the lungs	1
Consultation case; antepartum hæmorrhage; woman moribund upon arrival of Hospital	1
Erysipelas, facial	1
Inanition; no cause could be assigned, except the low physical condition of the woman before labor	1
Morbus Maculosus Werlhofii; postpartum hæmorrhage	1
Pneumonia, acute lobar	1
Placenta prævia	1
Phthisis; hæmorrhage and œdema of lungs	1
Postpartum hæmorrhage in induction of labor, 7th month	1
Rupture of uterus (one case with septicæmia also)	3
Septicæmia (one case with placenta prævia and one a midwife case)	8
Surgical kidney in Bellevue Hospital after operation for vesico-vaginal fistula acquired under care of outside physicians	1
Uræmia and eclampsia	8
Total	29

Possible Causes of Still Birth in Cases of Vertex Presentation.

	Cases.
Anencephalus	1
Child of unusual size (15 lbs.), difficulty in delivery of head	1
Cord around child's neck once	7
" " " " three times	1
" " " " five times, once around shoulders	1
" " " shoulders	2
Deformed pelvis in mother	8
" " cord around neck once	1
" " prolapse of cord	5
" " tonic contraction of uterus, prolonged labor—93 hours	1
" " fracture of child's skull	2
" " prolapse of cord; hydramnios	1
" " prolapse of cord and upper extremity	1
" " hydrocephalus	1
" " cord around neck; pressure of forceps blade upon cord	1
Extreme moulding of child's head	1
Eclampsia	1
Eclampsia; twins	2
Hydramnios	2
Hydrocephalus	1
" prematurity	1
Macerated	34
" prematurity	9
" hydrocephalus	1
" twins	2
" deformed pelvis	1
Prematurity	11
" twins	1
" cord around neck of child once	2
Prolapse of cord	11
" " twins	1
" " extension of upper extremity after version	2
" " and of upper extremity; fracture of humerus	1
Prolonged labor	4
" " cord around neck of child once	1
Placenta prævia	2
" " prematurity	1
" " prolapse of upper extremity	2
Rupture of uterus	4
" " prolapse of cord	1
Twins	9
Tonic contraction of uterus; contraction ring; patient in state of collapse; delivery attempted by outside physicians	1
No complications	68
Total	211

Day of Death of Children in Vertex Presentation, Dying During the Puerperium.

Of the 8,284 children born alive in vertex presentation, 149 died during the puerperium.

85	children	died	on the	1st	day of life.
14	"	"	"	2d	" "
8	"	"	"	3d	" "
9	"	"	"	4th	" "
6	"	"	"	5th	" "
5	"	"	"	6th	" "
6	"	"	"	7th	" "
3	"	"	"	8th	" "
3	"	"	"	9th	" "
3	"	"	"	10th	" "
1	child	"	"	13th	" "
2	children	"	"	15th	" "
1	child	"	"	18th	" "
1	"	"	"	19th	" "
1	"	"	"	21st	" "
1	"	"	"	23d	" "
149					

The remaining 8,135 children were discharged from the care of the Hospital in good condition.

Causes of Death of Children in Cases of Vertex Presentation, Dying During the Puerperium.

	Cases.
Anencephalus	1
Atelectasis	9
Asphyxia	1
Convulsions	3
" forceps	2
" eclampsia in mother	1
" fontanelles bulging; pressure on fontanelles produced convulsions	1
Cholera infantum	1
Deformed pelvis; forceps	1
Depressed fracture of skull; deformed pelvis; version	1
Erysipelas	2
Eclampsia in mother; accouchement forcé	1
Fœtal deformities; undeveloped	6
Found dead upon postpartum visit; never presented any symptoms	3
Hæmorrhage from cord; parents attempted to detach cord forcibly	1
Hæmophilia	4

Inanition; could not be fed	2
Opium; overdose given by parents	1
Pneumonia	8
Prematurity (before the eighth month)	36
" fatty placenta	1
" deformed pelvis	1
Spina bifida	1
Syphilis	3
Suppurative infection of umbilical cord	1
" " " " icterus	1
" " " " cerebro-spinal meningitis	1
Suspended animation	22
" " placenta prævia; version	2
" " forceps	1
" " hydramnios	1
Weak and poorly nourished at birth	10
No cause assigned	16
" " " cyanosis	3
	149

With regard to the above table, and similar tables under other presentations, it should be said that it is often difficult for the Hospital to arrive at any satisfactory opinion as to cause of death, both on account of the difficulty of obtaining autopsies and because the children are so little under observation in the outdoor service. We have, therefore, recorded every symptom and circumstance which could throw light on the cause of death. There are many cases of prematurity, and many cases in which the children are of very low weight, poorly nourished, of low vitality, and it is practically impossible to feed them under tenement-house conditions. Such children are included under the headings, Prematurity, Inanition, Suspended Animation, Weak. It has also happened that children who were perfectly well at the last visit of the Hospital, have been found dead upon a subsequent visit.

An Analysis of Cases of Breech Presentation.

Total number of cases of breech presentation	341
Number of mothers who survived	335
" " " died *	6
Number of children born alive	255
" " still-born	86
" " dying during puerperium	35

Day of Death of Mothers.

1 mother died on	Labor day.
1 " " "	1st day postpartum.
3 mothers " "	2d " "
1 mother " "	22d " "

* Of these six cases, there are four cases of twins, in which one child was a vertex presentation. (See footnote under Analysis of Vertex Presentation.)

Cause of Death of Mothers in Cases of Breech Presentation.

(See list of Fatal Cases, C. N. 864; 1,547; 2,381; 4,655; 5,955; 10,218.)

	Cases.
Erysipelas	1
Septicæmia	1
Suppression of urine; Cæsarean section	1
Uræmia and eclampsia	3
	6

Possible Causes of Still Birth in Cases of Breech Presentation.

	Cases.
Anencephalus	2
Cord around neck of child three times	1
Deformed pelvis	3
Early rupture of membranes (several days): tonic contraction of uterus	1
Hydrocephalus	3
Lower extremity extended; in labor three days before calling Hospital.	1
Macerated	11
" deformed pelvis	2
" prematurity	12
" cord around neck of child six times	1
" upper extremities extended	1
" both upper and lower extremities extended	1
Prematurity	5
" hydramnios	1
" cord around neck of child once	1
" twins	2
Prolapse of cord	1
" " upper extremities extended	1
" " " " " fracture of humerus	1
" " " " " jaw	1
" " prolapse of lower extremities; upper extremities extended	1
Upper extremities extended	1
" " " prolapse of lower extremities; contraction ring present	1
" " " together with lower extremities	1
" " " together with lower extremities; arms locked behind head	1
" " " twins	1
Midwife in charge of case; delay of one hour in birth of shoulders	1
Neglected breech; child partly born upon arrival of Hospital	1
Placenta prævia; prematurity	1
Twins	3
No complications	22
	86

Day of Death of Children in Cases of Breech Presentation, Dying During the Puerperium.

Of the 255 children born alive in breech presentation, 35 died during the puerperium.

23	children	died	on	the	1st	day	of life.
3	"	"	"	2d	"	"	
4	"	"	"	3d	"	"	
1	child	"	"	4th	"	"	
1	"	"	"	7th	"	"	
1	"	"	"	9th	"	"	
1	"	"	"	11th	"	"	
1	"	"	"	12th	"	"	
35							

The remaining 220 children were discharged from the care of the Hospital in good condition.

Causes of Death of Children in Cases of Breech Presentation, Dying During the Puerperium.

	Cases.
Atelectasis	2
" prematurity	1
Anencephalus	1
" Cæsarean section	1
Cholera infantum	2
Convulsions; icterus; umbilical stump normal	1
Fœtal deformities; undeveloped	1
Delayed labor; head caught in cervix	1
Prematurity	11
" fatty placenta	1
Pneumonia	2
Suspended animation	4
Spina bifida	1
Syphilis	1
Small hæmorrhage into pleura and pericardium; no cause discovered on autopsy	1
Weak	2
No cause	2
	35

An Analysis of Cases of Shoulder Presentation.

Total number of cases of shoulder presentation	91
Number of mothers who survived	84
" " " died	7
" children born alive	67
" " still-born	24
" " dying during the puerperium	2

Day of Death of Mothers.

3 mothers died on	Labor day.	
1 mother died on	1st day	postpartum.
1 " "	3d "	"
1 " "	10th "	"
1 " "	12th "	"
7		

Cause of Death of Mothers in Cases of Shoulder Presentation.

(See list of Fatal Cases, C. N. 330; 349; 426; 769; 3,562; 5,686; 5,824.)

	Cases.
Carcinoma of the cervix; postpartum hæmorrhage	1
Pneumonia, acute lobar	1
Placenta prævia	2
Prolonged labor; impacted shoulder; midwife	1
Septicæmia; pneumonia	1
Uræmia and eclampsia	1
	7

Possible Causes of Still Birth in Cases of Shoulder Presentation.

	Cases.
Anencephalus; hydramnios	1
Deformed pelvis	1
" " impaction of shoulder at outlet; decapitation	1
Forceps to after-coming head	1
Prematurity	1
Placenta prævia	1
" " prematurity; prolapse of cord	1
Prolapse of cord	2
" " prolapse of upper extremities	2
" " " " " tonic contraction of uterus	2
" " and right hand; left arm extended	1
Prolapse of upper extremities	1
" " " case in charge of midwife	1
" " " cord four times around neck of child	1
Upper extremities extended; cord once around neck of child	1
Uræmia in mother	1
Tonic contraction of uterus; contraction ring present	1
Twins	1
No complications	3
	24

Day of Death of Children in Cases of Shoulder Presentation, Dying During the Puerperium.

Of the 67 children born alive, 2 died during the puerperium.

1 child died on the ..... 1st day of life.
1 " " " ..... 5th " "

Causes of Death of Children in Cases of Shoulder Presentation, Dying During the Puerperium.

	Cases.
Convulsions; no cause	1
Suspended animation; placenta prævia	1

The remaining 65 children were discharged from the care of the Hospital in good condition.

An Analysis of Cases of Face Presentation.

Total number of cases of face presentation	36
Number of mothers who survived	36
" " " died	0
" children born alive	33
" " still-born	3
" " dying during the puerperium	3

The position in the 36 cases of face presentation was as follows:

	Cases.
L. M. A.	12
R. M. A.	11
	23

	Cases.
L. M. P.	7
R. M. P.	6
	13

	Cases.
In the anterior positions, delivery occurred by normal mechanism	19
Whole child turned to obtain a vertex anterior position	1
Manual assistance to flexion as face was born	1
Podalic version for prolapse of cord	1
" " " uterine inertia	1
	23

	Cases.
In the posterior positions, delivery occurred by normal mechanism	3
Manual rectification to vertex anterior position	1
Podalic version	5
Forceps with rotation to mento-anterior	4
	13

Possible Causes of Still Birth in Cases of Face Presentation.

	Cases.
Anencephalus; hydramnios	1
Attempted forceps; podalic version; woman had been the subject of Alexander's operation	1
Rectification attempted; podalic version	1
	3

Day of Death of Children in Cases of Face Presentation, Dying During the Puerperium.

Of the 33 children born alive in face presentation, 3 died during the puerperium.

1 child died on the ..... 1st day of life.
2 children died on the ..... 2d day of life.

The remaining 30 children were discharged from the care of the Hospital in good condition.

Causes of Death of Children in Cases of Face Presentation, Dying During the Puerperium.

	Cases.
Broncho-pneumonia	1
Suspended animation	1
" " podalic version; fracture of humerus	1
	3

There were four cases of brow presentation.

All of the mothers survived, and all of the children were born alive.

In two cases the brow presentation was changed manually into an anterior position of the vertex. In one of these two cases, labor was thereafter terminated normally. In the other case, forceps failed to accomplish delivery, and podalic version was performed. This child subsequently developed into a microcephalic idiot.

In one case the brow presentation changed spontaneously into an anterior position of the face, and labor progressed to a normal termination.

In one case symphysiotomy was performed for deformed pelvis. The child was then delivered by podalic version, and breech extraction after version.

There were also two cases in which the ear presented. In one case the child was born alive by means of podalic version. In one case the lower uterine segment was so thinned that podalic version was not considered a safe procedure. The child was dead, and craniotomy was performed.

It will be noted that the children whose day of death and the causes of whose death have been recorded in the preceding tables under the analysis of the several presentations, are children whose presentation was observed at the time of labor. There were also 1,264 cases in which the presentation was not observed. Among these 1,264 cases there were 813 children born alive. Of these 813 children born alive, 25 died during the puerperium. In order, therefore, to make complete the records of death of children dying during the puerperium, the following tables must be added:

DAY OF DEATH OF CHILDREN IN CASES IN WHICH PRESENTATION COULD NOT BE OBSERVED, DYING DURING THE PUERPERIUM.

15	children	died	on	the	1st	day	of life.
4	"	"	"	2d	"	"	
1	child	"	"	3d	"	"	
1	"	"	"	7th	"	"	
1	"	"	"	9th	"	"	
1	"	"	"	13th	"	"	
1	"	"	"	15th	"	"	
1	"	"	"	23d	"	"	
25							

The remaining 788 children born alive in cases in which presentation could not be observed, were discharged from the care of the Hospital in good condition.

CAUSES OF DEATH OF CHILDREN IN CASES IN WHICH PRESENTATION COULD NOT BE OBSERVED, DYING DURING THE PUERPERIUM.

	Cases.
Atelectasis; prematurity	1
" twins	1
Fœtal deformities; undeveloped	1
Hæmophilia	1
Hæmorrhage from nose; found dead upon postpartum visit	1
Pneumonia	1
Prematurity	8
Purulent conjunctivitis; tympanites; diarrhœa	1
Suspended animation	1
Stomatitis	1
Traumatism; fell to floor in precipitate labor	1
Unattended; deep cyanosis and cold surface; moribund upon arrival of Hospital	1
Weak; could not be fed	1
No cause or symptoms found	5
	25

UMBILICAL CORD.

7,787 observations.

						Cases.
The cord was detached on the				1st	day in	3
"	"	"	"	2d	"	61
"	"	"	"	3d	"	655
"	"	"	"	4th	"	1,799
"	"	"	"	5th	"	2,203
"	"	"	"	6th	"	1,648
"	"	"	"	7th	"	829
"	"	"	"	8th	"	413
"	"	"	"	9th	"	139
"	"	"	"	10th	"	37
						7,787

UTERUS.—HEIGHT ABOVE SYMPHYSIS, IN INCHES, DURING PUERPERIUM.

Day.	1 Inch.	2 Inches.	3 Inches.	4 Inches.	5 Inches.	6 Inches.	7 Inches.	8 Inches.	9 Inches.	10 Inches.	11 Inches.	12 Inches.	13 Inches.	Number of Cases Observed.
Labor	12	18	109	580	1,729	1,957	755	165	29	6	1	..	1	5,362
1st	24	59	347	1,691	3,411	2,671	797	174	24	10	..	..	..	9,208
2d	21	116	748	2,873	3,331	1,572	354	87	10	1	..	..	..	9,113
3d	31	274	1,626	3,564	2,565	777	137	17	2	1	..	..	..	8,994
4th	75	522	2,559	3,291	1,626	375	62	10	..	..	..	..	.	8,520
5th	144	1,033	2,830	2,801	1,085	208	26	4	..	..	..	..	..	8,131
6th	246	1,379	2,706	2,081	612	120	15	...	..	..	..	..	..	7,159
7th	330	1,270	2,114	1,232	410	74	11	...	..	..	..	..	..	5,441
8th	313	1,121	1,547	724	168	49	5	2	1	..	..	..	1	3,931
9th	250	539	768	336	91	18	2	...	..	..	..	..	..	2,004

PLURAL BIRTHS.

In the period covered by this report of 10,233 cases there were 161 cases of twins, or one to every 63.55 cases.

There was one case of triplets.

PRESENTATION.

In the 132 cases of twins in which it was possible to make observations, the presentation was as follows:

	Cases.		Cases.
Vertex and breech	58	Breech and shoulder	4
Both vertex	55	Vertex and shoulder	3
Both breech	11		
Vertex and face	1	Total	132

In the case of triplets, the presentation was, first, vertex; second, breech; third, vertex.

PLACENTA.

In the arrangement of placenta and membranes it was found that the placenta was:

	Cases.
Single	71
Double	82
Unknown	8
Total	161

Amniotic Cavity.

The amniotic cavity was:

	Cases.
Single	7
Double	95
Unknown	59
Total	161

In the case of twins there was:

	Cases.
A single placenta and double amniotic cavity	43
A single placenta and single amniotic cavity	4
A double placenta and single amniotic cavity	1

In the case of triplets there was a double placenta with a very small placenta succenturiata. There was a double and a single amniotic cavity.

Sex.

In the case of twins the sex was as follows:

	Cases.
Male and female	66
Both female	35
Both male	53
Unknown	7
Total	161

In the case of triplets the sex was:
First child, female.
Second child, male.
Third child, male.

Mortality.

The result to mother and child in the twin cases was as follows:

	Cases.
Mother living	156
" dead	5
Total	161
Living children	287
Still-born	35
Total	322

In the case of triplets, all three children were living.

Cause of Death of Mother.

	Cases.
Erysipelas (antepartum)	1
Eclampsia "	4
Total	5

Possible Causes of Still Birth in Twin Cases.

	Cases.
Abortion	2
Child born before arrival of Hospital	4
" " " " " membranes unruptured	1
" " " " " early separation of placenta	1
" " " " " midwife in attendance; body born; head retained within pelvis	1
Eclampsia in mother; accouchement forcé	2
Forceps low	1
Fœtal heart sounds not heard; cord not pulsating	1
Fibrous degeneration of placenta	1
Macerated	7
Mummified fœtus (of four months of fœtal life, with living fœtus of six months of fœtal life)	1
Placenta prævia; manual extraction; prematurity	4
Prematurity; manual extraction	3
Prolapse of funis; fœtal heart sounds not heard	1
Separation of placenta before labor; antepartum hæmorrhage; short umbilical cord; three coils of cord around child's neck	1
Shoulder presentation; prolapsed arm; extended arm locked behind child's head	1
No cause assigned in history	3
	35

Day of Death of Children of Twin Cases, Dying during Puerperium.

	Cases.		Cases.
Death on Labor day	15	Death on 6th day	2
" 1st "	12	" 7th "	1
" 2d "	3	" 8th "	0
" 3d "	2	" 9th "	2
" 4th "	1	" 10th "	0
" 5th "	0	Total	38

The remaining 249 children were discharged from the care of the Hospital in good condition.

Causes of Death in Children of Twin Cases, Dying during Puerperium.

	Cases.
Atelectasis; prematurity	2
Circulation poor; respiration superficial	2
Convulsions on 6th and 7th days; icterus; died on 7th day; born in 8th month intrauterine life; umbilical cord separated on 4th day without suppuration	1
Cholera infantum	1
Hæmorrhages, small in size, into pleura and pericardium, shown by autopsy; no definite cause discovered	1
Poorly nourished; would not nurse	5
Prematurity (born before eighth month)	18
No cause assigned (one child described as deeply cyanosed)	8
	38

The induction of labor has been performed ten times in the service of 10,233 cases, or once in 1,023 cases. The following table will show the results:

C. N.	PARA.	MO. OF GEST.	INDICATION.	METHOD.	DELIVERY.	RESULT.	
						Mother.	Child.
2,645	VI.	7½	Deformed pelvis...	Sterilized glycerine.....	Strong contractions in 3 hrs. Breech extraction	Living.	Still-born.
2,723	I.	9	Albuminuria.....	" "	No contractions; accouchement forcé	"	Living.
2,839	II.	8½	Deformed pelvis...	" "	Strong contractions; labor 6 hrs. in duration	"	"
3,343	I.	9	Uterine inertia in 1st stage.	Sterilized Glycerine at two different times.	Strong contractions for 4 hrs.; then inertia; forceps.	"	"
3,670	II.	9	.....	Sterilized glycerine.....	Strong contractions in 2 hrs. Breech extraction	"	Still-born.
4,031	I.	8½	Albuminuria.....	" "	Strong contractions in 1 hr.....	"	Living.
5,205	VII.	7½	.....	" "	.....	"	"
5,473	XII.	7	.....	Sterilized glycerine on two successive days.	Immediate contractions twice, followed by inertia; version.	Died.	"
5,998	VI.	9	Albuminuria.....	Sterilized glycerine at two different times.	Strong contractions	Living.	"
6,036	I.	10	"	Sterilized glycerine.	Strong contractions in 10 hrs....	"	"

It will be noted that glycerine injections were used in all cases. In three cases the injections were repeated when the contraction ceased. In five cases labor was finally terminated by operative interference of some kind, owing to complete uterine inertia. The one case of death in the mother was due to postpartum hæmorrhage. Children living, 8; still-born, 2.

Forceps.

The operation of forceps was performed 290 times in the service of 10,233 cases, or once in 35.29 cases.

The observations are tabulated as follows:

High forceps was performed in 86 cases.

	Cases.
Death of mother	3
" " child	3
Still birth	8
To after-coming head	4
Death of mother	2
Still birth	4

Median forceps was performed in 87 cases.

	Cases.
Death of mother	1
" " child	1
Still birth	10

Low forceps was performed in 117 cases.

	Cases.
Death of mother	1
" " child	2
Still birth	9
Not noted	4

Symphysiotomy.

The operation of symphysiotomy has been performed six times in the service of 10,233 cases. In all six cases the incision has been made over the joint, and the joint has been opened from behind forward and from above downward. Gauze drainage has been used for twenty-four hours at least. The sutures have attempted to include the fibrous tissue over the joint.

In all six cases the child has been delivered by version.

In all six cases living children were born, and the mothers recovered without loss of function and without inconvenience after resuming their duties.

Cæsarean Section.

Cæsarean section has been performed twice in the service of 10,233 cases, or once in 5,116.5 cases.

In one case (C. N. 5,506; Dr. Markoe) the operation was performed for deformed pelvis. Both mother and child survived.

The following is an outline of the other case (C. N. 5,955; Dr. Edgar):

Labor obstructed by fibroid tumor of lower uterine segment; breech presentation; hydramnios; Cæsarean section; anencephalic child; suppression of urine in mother; fever in mother; death of mother forty-eight hours postpartum.

The patient, a Russian, married, aged 35 years, para V., tenth month of gestation, was first seen by a Hospital officer, April 9, 1894. At this time the patient had already been several hours in the first stage of labor.

No history of any miscarriages could be obtained, and of the four previous labors difficulty had been experienced in the last one only, which occurred in 1892.

At 5 P.M. on April 9, 1894, when first visited by this Hospital, in the labor under discussion, weak uterine contractions were found to be present, the membranes intact, the breech presenting, and the subjective symptoms of obstructed labor well marked.

Further internal examination revealed a fibroid tumor, about the size of a small fœtal head, attached to the left wall of the lower uterine segment, and one inch above the ring of the internal os.

The tumor was of a hard consistency and filled in the upper and posterior space of the left half of the true pelvis. A space of only two inches was left between the right wall of the uterus and the right pelvic wall.

An attempt to push the tumor above the brim of the true pelvis was unsuccessful, even after the patient had been placed under ether.

Laparotomy was at once decided upon as offering the best chances for mother and child, and was accordingly performed. The usual Sänger Cæsarean operation was done, the uterus being turned out of the abdominal cavity before the incision in its wall was made.

An anencephalic fœtus was delivered, which survived forty hours. The mother developed total suppression of urine, with fever, and died forty-eight hours postpartum.

A fuller account of the case, with the bibliography of the subject of obstructed labor due to uterine fibromata, will appear in a subsequent report.

Craniotomy.

The operation of craniotomy was performed three times in the service of 10,233 cases, or once in 3,411 cases.

C. N. 2,176.—III. para; ninth month of gestation; ear presentation; woman gave previous history of puerperal sepsis which had been treated by abdominal section; uterus firmly bound by adhesions so as to be curved laterally, with convexity to left side; no fœtal heart heard; internal version impossible, on account of inability to reach feet, due to mal-position of uterus; craniotomy and extraction; recovery.

C. N. 2,769.—V. para; ninth month of gestation; vertex; L. O. A.; deformed pelvis. Podalic version; manual traction and traction with cephalotribe insufficient to accomplish delivery; after-coming head perforated through neck, and head extracted; recovery.

C. N. 5,416.—IV. para; ninth month of gestation; vertex; R. O. P.; deformed pelvis; version attempted; pulseless cord prolapsed; craniotomy and extraction; recovery.

Fatal Cases.*

It should be said, in regard to the following notes upon Fatal Cases, that it is very rarely possible to obtain an autopsy in the service of this Hospital, on account of the religious scruples of the Hebrews.

1. C. N. 161.—Age 28; III. para; eighth month of gestation; confined by Hospital; vertex; R. O. A.; postpartum hæmorrhage; septicæmia; pneumonia; death eleventh day.

2. C. N. 295.—Age 28; II. para; ninth month of gestation; confined by midwife; first seen sixth day postpartum; septicæmia; pneumonia; metastatic abscesses; hæmatemesis; death forty-eighth day postpartum.

3. C. N. 330.—Age 33; VIII. para; confined by Hospital; shoulder presentation; podalic version; suppression of urine; uræmia; death first day postpartum.

4. C. N. 349.—Age 34; thirty-fourth week of gestation; confined by Hospital; shoulder presentation; placenta prævia; podalic version; œdema of lungs; death third day postpartum.

5. C. N. 399.—Age 28; I. para; confined by midwife; first seen third day postpartum; septicæmia; collapse; death fourth day postpartum.

6. C. N. 420.—Age 24; I. para; confined by Hospital; hydrocephalus; vertex presentation; podalic version; severe lacerations of cervix and perineum; septicæmia; death sixth day postpartum.

7. C. N. 426.—Age not noted; I. para; ninth month of gestation; confined by Hospital after repeated failure by midwives to deliver; shoulder presentation; first seen in second stage; shock; podalic version; collapse; death on day of confinement.

8. C. N. 769.—Age 27; V. para; ninth month of gestation; confined by Hospital; shoulder presentation; general condition bad; podalic version; forceps to after-coming head; extensive carcinoma of the cervix; antepartum and postpartum hæmorrhage from cervix; collapse; death seven hours postpartum.

9. C. N. 864.—Age 40; VI. para; confined by Hospital; breech presentation; labor easy; puerperium normal until tenth day; septicæmia; sent to Bellevue Hospital fifteenth day postpartum; death twenty-second day postpartum.

10. C. N. 995.—Age 25; V. para; ninth month of gestation; confined by midwife; seen by Hospital on first day postpartum, with fever; septicæmia; curettage; acute exacerbation of pulmonary tuberculosis. Removed on sixth day to Gouverneur Hospital; died twenty-sixth day postpartum, of tuberculosis and septicæmia.

* Regarding the above notes on Fatal Cases, it should be said that the records show that all the cases were visited regularly by the attending physician or his assistant, whether he had been the operator or not.

11. C. N. 1,016.—Age 35; VII. para; ninth month of gestation; confined by Hospital; vertex presentation; labor normal; septicæmia; nephritis; death sixth day postpartum.

12. C. N. 1,093.—Age 35; X. para; ninth month of gestation; confined by midwife; labor easy; first seen third day postpartum; septicæmia; albuminuria; pneumonia; death sixth day postpartum.

13. C. N. 1,198.—Age 36; VI. para; sixth month of gestation; confined by Hospital; vertex presentation; placenta prævia; dilatation by Barnes's bags; rupture of uterus; podalic version; death second day, from shock.

14. C. N. 1,425.—Age 34; V. para; ninth month of gestation; confined by Hospital; vertex; R. O. A.; pulmonary œdema in second stage of labor, and symptoms of acute nephritis; death from above cause on fourth day.

15. C. N. 1,547.—Age (?); para (?); month of gestation (?); confined by Hospital; twins; vertex and breech presentations; breech extraction; facial erysipelas of eight days' duration; woman first seen in second stage of labor, and at that time was in collapse; death from shock on second day postpartum.

16. C. N. 1,723.—Age 38; VI. para; seventh month of gestation; confined by Hospital; vertex; L. O. A.; prolapse of hand; temperature on labor day, 101.1 degrees; pulse, 132; broncho-pneumonia and death on seventh day.

17. C. N. 2,381.—Age 24; I. para; ninth month of gestation; confined by Hospital; twins; vertex and breech presentations; low forceps; breech extraction; eclampsia; death on first day.

18. C. N. 2,429.—Age 35; XI. para; ninth month of gestation; confined by Hospital; vertex; L. O. A.; still birth; antepartum hæmorrhage; slight postpartum hæmorrhage; temperature on labor day, 100.2 degrees; death from inanition, on seventh day.

19. C. N. 3,267.—Age 34; VII. para; ninth month of gestation; confined by Hospital; vertex presentation; previously evidently in charge of midwife; patient suffering from shock when first seen; rupture of uterus, of several hours' duration; manual extraction of child and placenta from abdominal cavity through utero-vaginal rent; death in thirty-six hours, from shock.

20. C. N. 3,314.—Age 23; II. para; eighth month of gestation; confined by Hospital; vertex; R. O. P.; pendulous abdomen; rupture of uterus; prolapse of funis; podalic version; manual extraction of placenta; death fourth day, from shock.

21. C. N. 3,351.—Age 22; I. para; ninth month of gestation; confined by Hospital; vertex; R. O. P.; advanced pulmonary tuberculosis; pulmonary hæmorrhage before and during delivery; extensive œdema of lower extremities; pulmonary œdema; death from exhaustion in two hours postpartum.

22. C. N. 3,562.—Age 30; VII. para; ninth month of gestation; confined by Hospital; shoulder presentation; placenta prævia; hæmorrhage;

shock; accouchement forcé; podalic version; extraction; death from shock, a few hours later.

23. C. N. 3,564.—Age 21; I. para; ninth month of gestation; confined by Hospital; vertex; R. O. P.; eclampsia; low forceps; coma; death few hours postpartum.

24. C. N. 4,655.—Age 22; I. para; ninth month of gestation; confined by Hospital; twins; vertex and breech presentations; forceps; eclampsia; death on second day.

25. C. N. 4,683.—Age 24; II. para; thirty-fourth week of gestation; confined by Hospital; vertex; L. O. A.; eclampsia; manual dilatation; high forceps; death six hours later.

26. C. N. 4,726.—Age 22; III. para; ninth month of gestation; confined by Hospital; vertex; L. O. A.; Morbus Maculosus Werlhofii; severe hæmorrhage from mouth and uterus before and during labor; general condition bad; forceps; postpartum hæmorrhage. Death on first day, from hæmorrhage and shock.

27. C. N. 5,190.—Age 36; VI. para; ninth month of gestation; confined by Hospital; vertex; L. O. A.; septicæmia on third day postpartum; transferred to Bellevue Hospital on nineteenth day postpartum; subsequently died in Bellevue Hospital on an unknown day.

28. C. N. 5,473.—Age 38; XII. para; seventh month of gestation; confined by Hospital; vertex; L. O. A.; induction of labor for death of child in utero in last four pregnancies; manual dilatation; podalic version; postpartum hæmorrhage six hours after labor; death from hæmorrhage on first day.

29. C. N. 5,633.—Age 19; I. para; ninth month of gestation; confined by Hospital; vertex; L. O. A.; albuminuria; forceps for contracted pelvis; death on first day postpartum, of uræmia.

30. C. N. 5,686.—Age 26; VIII. para; ninth month of gestation; confined by Hospital; shoulder presentation and prolapsed hand; podalic version; septicæmia; curettage; pneumonia; death on twelfth day.

31. C. N. 5,708.—Age 34; IX. para; ninth month of gestation; confined by Hospital; vertex; L. O. A.; high forceps for contracted pelvis; sent to Bellevue Hospital on twenty-seventh day postpartum with vesico-vaginal fistula; subsequently died in Bellevue Hospital, of surgical kidney.

32. C. N. 5,799.—Age 24; III. para; ninth month of gestation; confined by Hospital; vertex; L. O. A.; general condition bad; history of tuberculosis, rheumatism, and cardiac disease; uterine inertia; manual dilatation; podalic version; septicæmia; death on twenty-fifth day postpartum.

33. C. N. 5,824.—Age 35; III. para; ninth month of gestation; confined by Hospital; shoulder presentation; version; death from acute lobar pneumonia on tenth day.

34. C. N. 5,955.—Age 35; V. para; ninth month of gestation; confined by Hospital; breech presentation; Cæsarean section for uterine fibroid; complete suppression of urine; death on second day.

35. C. N. 6,235.—Age 30; II. para; ninth month of gestation; confined by Hospital; twins; both vertex presentation; eclampsia; manual

dilatation ; podalic version for both children ; death seventh hour postpartum.

36. C. N. 6,925.—Age 21; II. para; eighth month of gestation; vertex; L. O. A. Case seen in consultation with outside physician; patient found in collapse ; moribund; symptoms of hæmorrhage; placenta delivered by Hospital; death on first day postpartum.

37. C. N. 7,070.—Age 26; II. para; ninth month of gestation; confined by Hospital ; vertex; L. O. A. ; eclampsia ; accouchement forcé ; Dürhssen's incision of cervix; podalic version; death thirty-six hours postpartum, from uræmia.

38. C. N. 7,263.—Age 41; XV. para; tenth month of gestation; confined by Hospital; vertex; R. O. A.; tedious labor; prolapsed cord; rupture of uterus; podalic version; septicæmia; death on sixth day.

39. C. N. 7,538.—Age 35; V. para; ninth month of gestation; confined by Hospital; vertex; R. O. A.; septicæmia; death tenth day postpartum.

40. C. N. 8,034.—Age 39 ; XIII. para; tenth month of gestation; confined by Hospital; vertex presentation; placenta prævia; manual dilatation; podalic version; postpartum hæmorrhage; death on second day, of septicæmia.

41. C. N. 10,047.—Age 30; XI. para; ninth month of gestation; midwife found in attendance; vertex; L. O. A.; deformed pelvis; septicæmia on eighth day; sent to Bellevue Hospital, where she died on twenty-second day postpartum.

42. C. N. 10,218.—Age 35; IV. para; tenth month of gestation; confined by Hospital; twins; vertex and breech presentations; eclampsia; death twenty-four hours after delivery, from uræmia.

In addition to the above deaths, one patient died before delivery.

A. N. 8,308.—Age 26; I. para; seventh month of gestation; advanced heart disease; treated for nine days with marked improvement; subsequent heart failure and death on the tenth day.

STUDENTS OF THE HOSPITAL.

Total number of graduate students	210
" " undergraduate students	1,335
" " cases at which students assisted in the confinement	7,495
" " cases in which the confinement was witnessed by students	8,242
" " pregnant women examined by students	5,145

The 210 graduate students registered from the following Medical Schools :

Medical Department of the University of the City of New York	60
Bellevue Hospital Medical College	32
College of Physicians and Surgeons	28
Medical and Surgical College of New York	1
Memphis Hospital Medical College	1
University of Vermont	8
Jefferson Medical College	1
University of Minnesota	2
Dartmouth Medical College	3
Queens College, Kingston, Ontario	1
Bowdoin College	1
University of Virginia	4
College of Physicians and Surgeons, Chicago, Ill	1
Yale University	7
Buffalo University	3
Columbia College, Washington, D. C.	5
New York Homœopathic Medical College	2
Chicago Homœopathic Medical College	1
Toronto Medical College	1
Long Island College Hospital	2
Sterling Medical College, Columbus, Ohio	1
Louisville Medical College, Louisville, Ky	2
Cooper Medical College, San Francisco	1
Maine Medical College	2
Marion Sims College, St. Louis, Mo.	1
St. Louis Medical College	1
Georgetown Medical College	2
Woman's Medical College, Chicago, Ill	2
University of Montana	1
" " Michigan	1
Eclectic Medical College	2
Atlanta " "	1
Syracuse " "	1
Albany " "	5
Rush " " Chicago, Ill.	1
Miami " " Cincinnati	1
Woman's " " "	3
University of Jena, Germany	1
" " Toronto, Canada	1
" " Niagara	1
" " South Tennessee	1
College of Physicians and Surgeons, Baltimore	1
Kentucky School of Medicine	1
New York Woman's Infirmary	2
Graduated Nurse from the New York Hospital	1
Graduated Nurses from the German Hospital	8
Graduated Nurse from the Womans' Hospital	1
Total	210

The 1,335 undergraduate students of the Hospital registered from the following Medical Schools :

Medical Department of the University of the City of New York	582	Harvard University Medical College	1
Bellevue Hospital Medical College	370	Womans' Medical College, New York	2
College of Physicians and Surgeons	221	Tufts College, Medford, Mass	2
New York Homœopathic Medical College for Women	6	Syracuse Medical College	2
New York Homœopathic Medical College	49	Dartmouth Medical College	14
Long Island College Hospital	17	Jefferson Medical College	1
University of Virginia	1	Buffalo University	7
" " Kingston, Ontario	1	Michigan University	2
Yale University Medical School	14	South Carolina Medical College	1
University of Vermont	2	Ann Arbor Medical College	1
College of Physicians and Surgeons, Chicago, Ill	1	Niagara University	1
New York Eclectic Medical College	5	McGill College, Montreal, Canada	1
Albany Medical College	22	Toledo Medical College	1
Columbia Medical College, Washington, D. C	5	Howard Medical School, Raleigh, N. C	1
		Cleveland University Medical College	2
		Total	1,335

STATISTICAL REPORT OF FORCEPS OPERATIONS.

By Austin Flint, Jr., M.D.

Of the various operations in obstetrics, by far the most frequently performed is a forceps operation. The application of forceps may be indicated in so great variety of conditions, that it has seemed to the writer that the subject was of sufficient importance to make a special report of the cases occurring in the service of this Hospital.

All of the cases upon which observations were made occurred in the outdoor service of the Hospital. As "delayed labor" was the most frequent indication, it may be proper to describe something of the routine treatment of cases in which forceps were applied. Patients are under the immediate care of students, who are not allowed, under any circumstances, to interfere with the course of labor. Reports from students are sent to the Hospital at frequent intervals. The cases are visited by members of the staff assigned to outdoor duty, who supervise the students' work, confirm the reports as regards diagnosis, and instruct the students in the various details of the management. In cases of abnormalities of any sort, the details are sent to the sub-station or to the Hospital directly, as may be more convenient, and nothing is done by the staff member present unless there is immediate necessity. Cases in which forceps are indicated are thus referred first to the Hospital, and from there to the attending physician on duty. This routine makes the application of forceps less frequent than is usual in hospitals conducting a purely indoor service.

Forceps were applied 294 times, or in 2.87 per cent. of all cases. This percentage is 2.99, subtracting the 417 abortion cases from the total.

The general results were:

Of the mothers	288	recovered.
" "	6	died.
Total	294	

Of the children	252	recovered.
" "	33	were still-born.
" "	9	died during the puerperium.
Total	294	

This is a maternal mortality of 2.04 per cent., and an infant mortality of 14.35 per cent.

Of the six fatal cases, five occurred after a high operation, and one after a low operation. In but two instances could the fatal result be ascribed in any way to the operation.

The cause of death and operations are divided as follows:

	Cases.
Eclampsia, high operation	2
Sepsis, " "	2
Hæmorrhage and shock, high operation	1
Eclampsia, low operation	1
Total	6

In one-half of the cases, therefore, eclampsia was the direct cause of death, and the operation was merely incidental. The case of hæmorrhage and shock was antepartum, and is recorded as the indication for the forceps delivery. It is probable that there was a low implantation of the placenta. The remaining two deaths were due to sepsis, which might have occurred under the surrounding conditions, even if the forceps had not been applied. The causes of the fœtal deaths do not admit of exact determination. Undoubtedly many of the still-born children were dead at the time of operation. No fœtal heart sound could be heard in a larger number of cases than the total number of still-births registered. The necessity of making some exact distinction between the high, median, and low operations, was appreciated early in the history of the Hospital, but it was not until a large number of operations had been recorded that such a distinction was made. The figures in the whole series, therefore, make no mention of median forceps, but the "high operation" is defined as an operation within the uterus, whether the forceps blades were applied above the pelvic brim or within the excavation. The term "low operation" is defined as an operation in which the blades are applied to the presenting part when it had reached the pelvic floor and had passed through the cervix.

I have included under high operations a large number of cases which were really median operations, in order to be consistent in the earlier and later observations.

The classification now employed is as follows:

1. *High Forceps.*—The greatest diameter of the head is above the brim of the pelvis.

2. *Median Forceps.*—The greatest diameter of the head has passed the brim of the pelvis, subdivided into:

   (*a*) Within the cervical canal.

   (*b*) Outside the cervical canal.

3. *Low Forceps.*—The head is on the pelvic floor.

As nearly as it is possible to determine, the median operation was performed eighty-seven times.

Including most of the median operations among the high, forceps were applied as follows:

High	141 times.
Low	153 "

The high operation, therefore, was done in a very large proportion of the total number. The explanation of this fact is the routine by which women are allowed to remain in labor until it is almost imperative that some active interference be employed. A large number of patients who finally deliver themselves, would be subjected to a low forceps operation in ordinary private practice. Such a routine is perhaps not so good obstetrics, but is far safer under the conditions than a more indiscriminate use of the forceps would be. Even after it has been determined that forceps would be advisable in a given case, the delay in reporting to the Hospital and securing the attending physician to operate, not infrequently results in a spontaneous delivery while the preparations for a forceps delivery are being made.

The total number of 294 observations includes not only actual deliveries, but all cases in which forceps were used at any time during labor. I have separated the latter cases and tabulated them, as follows:

	Cases.
1. Vertex presentations, in which forceps were attempted, and delivery was finally accomplished, after a podalic version	10
2. Vertex presentation, in which forceps were attempted, and delivery was left to nature	1
3. Breech presentation, in which the forceps were applied directly to the breech	1
4. Forceps to the after-coming head	3
Total	15

In two of the three cases of forceps to the after-coming head, delivery was accomplished; and in the other, after traction had been made, the forceps were removed, and delivery accomplished by manual efforts.

In the total number of 294 cases, the presentation was as follows:

Vertex	276	Brow	1
Face	5	Not noted	8
Shoulder	3		
Breech	1	Total	294

Forceps were applied directly to the presenting part in all but the three cases of shoulder presentations, which terminated as follows:

In one, cephalic version was performed, forceps applied to the head, which failed to engage, and delivery was effected after podalic version. In this case, both mother and child survived. In the second case, podalic version was performed, during which the cord prolapsed; forceps were

applied to the after-coming head, which was finally extracted manually, resulting in the recovery of the mother and death of the child.

In the third case, podalic version was performed, and the after-coming head delivered by forceps through a rigid cervix. The child was still-born and the mother recovered.

The position was as follows:

L. O. A	161	R. Scap. A	1
R. O. A	49	R. " P	1
L. O. P	25	L. " P	1
R. O. P	41	Not noted	10
R. M. P	3		
L. M. P	2	Total	294

In the total number of 276 vertex cases, the occiput occupied an anterior position in 210 cases, and a posterior position in 66 cases. Thus, in a large number of cases, the posterior position of the occiput was the cause of the delay, and an indication for forceps.

The number of the confinement is divided as follows :

I. para	155	IX. para	7
II. "	38	X. "	4
III. "	19	XI. "	3
IV. "	21	XII. "	1
V. "	14	XIII. "	1
VI. "	10	Not noted	9
VII. "	8		
VIII. "	4	Total	294

A little more than 50 per cent. were primipara.

Age.

Below 20	19	35–40	15
20–25	156	40–50	4
25–30	59	Not noted	12
30–35	29		
		Total	294

The indications for forceps include a large number of accidental complications. Nearly all the indications might be included in the term, "delayed tedious labor," but an attempt has been made to ascertain the cause of the delay, whenever possible. As the term is used in the table, the delay has been either in the case of a disproportion between the size of the head and the canal, without pelvic deformity, or an inherent weakness of the uterine contractions.

The indications and complications have been tabulated together, the complication frequently being the sole indication.

INDICATIONS AND COMPLICATIONS.

1. Delayed tedious labor (no cause for delay assigned)	108
2. Uterine inertia, exhaustion	65
3. Strong uterine contractions, no progress	26
4. Deformed pelvis	44
5. Eclampsia	8
6. Albuminuria (threatened eclampsia)	5
7. Rigidity and œdema of cervix	7
8. Occiput posterior, failure to rotate	7
9. Large head	5
10. Hæmorrhage	6
11. Prolapse of the cord	7
12. Face presentation	2
13. Brow, failure to extend	1
14. Prolapsed arm	1
15. Tonic uterine contractions	1
16. "Dry labor"	1
Total	294

I have thought it best, in making this table, to adhere closely to the histories. Apparent inaccuracies exist, but a close study shows that they are only apparent. For example, there were five face presentations in all, but only two appear as the indication, and the other three are included—two among "strong pains, no advance," and one among "uterine inertia." To change the indications and include the two apparently uncomplicated face presentations among the others, would necessitate a change in the history charts, and lead to endless complications and confusion. The indication "deformed pelvis" also needs some explanation. There were forty-four such cases recorded, as follows:

"Contracted or deformed"	27
Justo-minor	8
"Flat" and "promontory prominent"	9
Total	44

In but thirty of these was the deformity marked, as has been shown in an article elsewhere in this Report. In the remaining fourteen cases, a diagnosis of deformity was questionable, and not sustained by pelvic measurements. The histories of these questionable cases contain simply a statement, in the account of the operation, that the "pelvis was rather small," or "arch narrow," or "promontory jutted forward." They were usually consultation cases, with no actual measurements, and have not been

included as deformed in the article on *Pelvic Deformity*. They are recorded, however, as an indication for forceps, and the histories have not been changed, for the reasons stated before.

The condition of the fœtal heart at time of operation is recorded as follows:

	Cases.
From 120 to 130	29
" 130 to 140	102
" 140 to 150	61
" 150 to 160	14
" 160 to 170	2
" 170 to 180	1
Fœtal heart not heard	85
Total	294

The results as regards the mortality for children have already been stated.

It may be repeated in conclusion, that, while the foregoing statistical synopsis develops nothing new as regards the technique of forceps operations, the results are worthy of notice.

The forceps which are commonly employed are of the Elliot pattern, and have given general satisfaction. As a rule, they are used in the low operation, and have frequently been applied within the cervical canal. The axis-traction forceps of Prof. Alexander Simpson are also employed in the high operation. Forceps of various other patterns have been used by the Hospital from time to time, including the newer model of Tarnier in difficult deliveries, and the forceps of Milne-Murray.

The statistics show, perhaps, as the most prominent feature, that a conservative use of forceps is productive of good results. They were employed but once in about thirty-three deliveries. A very large proportion of the total, nearly one-half, were high operations. Notwithstanding this large proportion of high operations, and the frequency of complications, the mortality from all causes was but a fraction more than two per cent.

In another place in this Report the surroundings and disadvantages under which these operations were performed have been explained in detail.

Asepsis of the operator, instruments, and the field of operation, described in the article on *Morbidity and Mortality*, is the explanation of results which compare favorably with reports of operations performed under more cleanly surroundings.

Squalor and filth, while of unquestioned disadvantage, need not deter an operator from interfering in the course of labor when forceps are clearly indicated, provided facilities can be had for what may be called local antisepsis.

THE PREMATURE INTERRUPTION OF PREGNANCY.

By James Clifton Edgar, M.D.

Introduction.

We intend in this article to make a study of the prematurely interrupted pregnancies which occurred in the first 10,000 cases of confinement in the practice of this Hospital during the period from January 27, 1890, to February 28, 1896.

The histories of these 10,000 cases show that there was among them a total of 635 premature interruptions of pregnancy. In the three Medical Reports of the Hospital previously published, no mention has been made of these 635 cases of the untimely interruption of pregnancy, other than in a general way, so that we now purpose to make a critical study of the entire number.

Character of the Cases Studied in this Article.

The practice of this Hospital, during the period covered by this article, has been almost exclusively among the poorest of the Polish Jews, Germans, and Russians of the tenement-house district of the lower East Side of this city.

These people constitute an exceedingly primitive class, who are not only quite ignorant of the first principles of cleanliness, but who consider it the proper thing to neglect an untimely interruption of pregnancy, so that when the Hospital has been applied to for aid, it has usually been late in the course of the case, and for some serious complication as, for example, persistent hæmorrhage, or local or general septic conditions.

This is evident from the facts, as a critical study of our 635 cases shows that, in most instances, the symptoms had already existed for some time when the case was first brought to the notice of the Hospital, and that the large proportion of cases, when they were seen, were of the incomplete or neglected variety of the premature interruption of pregnancy.

Thus, as regards the duration of the symptoms, at the time when the Hospital physician was first summoned to the case, we find, from our analysis, the following:

Duration of Symptoms when First seen by the Hospital.

	EARLY ABORTIONS, 129 Observations.	LATE ABORTIONS, 57 Observations.
Average duration	3 days 22 hours.	6 days 19 hours.
Longest "	3 weeks.	7 weeks.
Shortest "	10 minutes.	1 hour.

Again, for example, the table setting forth the character of the early abortions (see Definitions), when first seen, indicates the following:

Complete early abortions	14
Incomplete " "	162
Inevitable " "	48
Threatened " "	6
Not noted " "	12
Total	242

As the foregoing table shows, a large proportion, namely, 162, of the early abortions were of the incomplete variety when the Hospital physician was first summoned; 48 were inevitable, and in only 6 instances were the services of the Hospital physician demanded before the partial or complete expulsion of the ovum.

Several interesting facts will be noted from a study of the first of the above tables.

In the first place, in both the early and late abortions, the average time from the onset of the symptoms to the application to the Hospital for aid, was over three days; and, in the second place, in the late abortions (see Classification and Definitions), this same interval was nearly twice as long as in the early abortions, as one would naturally suppose would be the case, in view of the larger amount and greater frequency of the hæmorrhage in interrupted pregnancies occurring in the first third of gestation.

Since, as we have shown in the preceding paragraph, most of our cases of abortion have been seen late in the progress of the process, some of the statistics of this article cannot, in fairness, be compared with those of the large maternities of France and Germany, in which many of the cases were under observation from the very onset of the symptoms.

The following tables of attendance in early and late abortions and in spontaneous premature labor cases also emphasize the above statements:

Attendance in Early Abortion Cases.

Number of cases confined by the Hospital	88
" " " unattended	143
" " " not noted on histories	11
Total	242

Attendance in Late Abortion Cases.

Number of cases confined by the Hospital	60
" " " unattended	99
" " " not noted on histories	16
Total	175

Attendance in Spontaneous Premature Labor Cases.

Number of cases confined by the Hospital	170
" " " unattended	28
" " " not noted on records	20
Total	218

It is not alone in maternity hospitals, but in private practice as well, that histories and reported cases of interrupted pregnancies would prove of the utmost value; because, as Winckel has observed, more interrupted pregnancies occur in private practice than ever come to hospitals for treatment, and such cases are more favorable for active interference, because seen earlier, and, moreover, the effect of an early curettage upon subsequent uterine disease and conception can be critically observed.

These 635 cases of the premature interruption of pregnancy treated by this Hospital are from among the abject poor, who, by reason of their poverty, are unable to procure the services of skilled medical assistance, and who, unless treated in some such service as this Hospital carries on, would receive little treatment, would be neglected, or would have no attention whatever in their confinements.

These individuals are, in the main, foreigners, or but recently naturalized, and are, of necessity, of the tenement-house population, as is shown by the accompanying figures.

Thus, of the first 8,068 cases of confinement treated by this Hospital, we find that there were:

5,395 Russians,	346 Germans,
724 Native Born,	211 Poles,
583 Austrians,	138 Hungarians,

and the remainder Italians, Roumelians, Swedes, etc.

It will be seen, therefore, that it is among the foreign-born population, and especially among the Russians, Austrians, Germans, and Polish-Hebrews, that these cases have been treated.

Moreover, the above-cited 10,000 cases of confinement were treated in their own homes, situated in the tenement-house district of the lower East Side of the city.

The tenement-house census for 1893 shows that the most densely populated area in New York City is situated in this district covered by the Hospital Service in the Eleventh Ward, and is bounded by Second Street, Columbia, Rivington, and Clinton Streets, and is known as Sanitary District *A* of the ward.

This area contains 32 acres, has a population of 25,615, or about 800 persons to the acre, equal to a population of 513,901 to the square mile.

It is interesting to note that the density of population in the above-cited area has actually increased during the past few years.

Thus, in the Annual Report of the New York City Board of Health for 1894, p. 101, we find:

YEAR.	WARD.	SANITARY DISTRICT.	DENSITY PER ACRE.
1890	11th.	*A*.	763.59
1893	11th.	*A*.	800.47
1894 (estimated)	11th.	*A*.	986.4

Previous to 1890, Germans and Bohemians predominated in this district; after 1890, Germans and Hungarians. (Vital Statistics, p. 101.)

Again, during the past thirty years the greatest density of population per acre was to be found in the Sixth, Tenth, and Eleventh Wards, all of which are included in the tenement-house district of the lower East Side, above referred to.

Thus, the following table, taken from the Report of the Tenement-House Committee to the New York State Senate (1894),* indicates at a glance the progressive increase of population in these wards during the thirty-four years:

YEAR.	WARD.	DENSITY PER ACRE.
1860	6th.	310.4
1870	11th.	327.7
1880	10th.	432.3
1890	10th.	525.6
1894 (estimated)	10th.	701.9

The New York State Census for 1892 shows that the *seven most densely populated* blocks in this city have each a population exceeding 3,000 persons to the block, and an aggregate population of 22,970.

* Report of the Tenement-House Committee to New York State Senate, 1894, by F. E. Pierce.

The first of these is in the district covered by the service of this Hospital, and they have the following boundaries:

	Population.
2d and 3d Streets, Avenues B and C	3,532
48th and 49th Streets, 10th and 11th Avenues	3,517
48th " 49th " 9th " 10th "	3,365
49th " 50th " 10th " 11th "	3,339
44th " 45th " 10th " 11th "	3,151
52d " 53d " 9th " 10th "	3,040
39th " 40th " 9th " 10th "	3,026
Aggregate population	22,970

Further, the same census shows that seven blocks in the immediate vicinity of the original administration building of this Lying-in Service (314 Broome Street), in which district the majority of the cases included in this article were treated, have each a population of 2,500 individuals or over, and an aggregate population of 18,603.

These blocks and their population are as follows:

	Population.
Ridge, Pitt, East Houston, and Stanton Streets	2,985
Market, Pike, Madison, and Henry Streets	2,503
Market, Pike, Madison, and Monroe Streets	2,586
Pike, Rutgers, Madison, and Monroe Streets	2,662
Madison, Monroe, Scammel, and Jackson Streets	2,500
Rivington, Stanton, Willett, and Pitt	2,548
2d and 3d Streets, Avenues A and B	2,819
Aggregate population	18,603

The most densely populated district is bounded by Second Street, Rivington, Columbia, and Clinton Streets; it covers 32 acres, has a population of 25,615, or 800 per acre, according to the Tenement-House Census of 1893. This makes a population of 513,901 persons to the square mile.

Some interesting figures concerning the inhabitants of a portion of the district covered by this Hospital are to be found in the latest special report of the Commissioner of Labor at Washington.

The tenement-house districts investigated are those of New York, Chicago, Baltimore, and Philadelphia, and these by sample, as it were. Thus, in New York, for instance, the districts chosen were west of the Bowery, wholly within the Sixth and Fourteenth Wards, and made up of an almost exclusive Italian population, though it included Chinatown.

Directly adjoining this district, to the east, across the Bowery, is one in which most of the cases treated in this Report reside, a people exclusively Russian Hebrew; and just to the south, on Cherry Hill, a characteristic Irish population.

Neither of these two latter districts found a place in the above Report, which in some important particulars they would have modified, but all these are included in the service of this Hospital.

The investigations of the Commissioner sought the plain facts of slum life, and such as might be arranged for statistical study.

Foreigners Predominate.—In New York the foreign-born number 42.23 per cent. of the total population of the city, but in this tenement-house district studied, it reaches 62.58, an excess of 20.35 per cent. Persons of foreign parentage are largely in excess, namely, 95.23 per cent. for this district, to 80.46 per cent. of the whole city; in other words, only 4.77 per cent. were of native parentage. 54.61 per cent. are males, and 45.39 per cent. are females. This preponderance of the men perhaps accounts for the greater wickedness of this district, as the police records of arrests show a proportion of 1 in 6 for this district, and 1 in 18 for the entire city.

They are a Conjugal People.—They marry early and have larger families than those who are better off as to residence. Single blessedness is unpopular, widowers are scarce; some widows were reported, but fewer than the proportion shown by a census of the whole city; divorce is all but unknown, only .01 per cent. of males and females were reported as divorced.

Illiteracy.—For New York, as a whole, the percentage of illiterates is 1.16 of the whole native-born population, and 14.06 of the foreign-born, the percentage for both being 7.69, while for the district under discussion, the percentage of native-born who are illiterate is 7.20, and of the foreign-born, 57.69, being, for both, 46.65. Fortunately, the illiteracy is almost entirely confined to adults.

There are more women who cannot read than men, and in point of succession, the most ignorant are the Italians, then come the Russians, then the Poles.

Crowded Tenements.—Comparing similar tenement-house districts of Baltimore, Philadelphia, New York, and Chicago, New York has, by far, the greatest crowds under one roof, but the percentage of crowding in the rooms is smaller than in the other cities named; thus, the percentage of families living in one room is 13.16 in Baltimore, 12.10 in Philadelphia, 5.87 in Chicago, and 5.62 in New York.

It should be added that the houses are larger in Chicago and New York than in the other cities named.

Sanitary Cleanliness.—Only 2.33 per cent. of the families have access to a bathroom, the percentage for the similar districts being, in Baltimore, 7.35; in Philadelphia, 16.90; in Chicago, 2.83; 96.67 per cent. of the houses of the district in New York have no bathrooms, and the average number of persons compelled to use the same water-closet or privy is 10.52 persons (in Philadelphia the number is 6.86).

Classification and Definitions.

It will be well at the outset, before entering upon a closer examination of the cases of interrupted pregnancy included in this article, to set forth clearly our classification of these cases, and come to a definite understanding of the definitions of the terms here used.

We find that most of the German textbooks of obstetrics, with the

exception of those of A. Martin and Winckel, look upon the separation of abortion and immature labor as unjustifiable, and consider the period of viability, at the end of the seventh month, as the only admissible point of division.

It will be found, moreover, upon reference to most of the French text-books, that they understand the term *avortement* to extend to the end of the seventh month of intrauterine gestation.

According to Veit (Müller's Handbook), all cases occurring within the first twenty-eight weeks of pregnancy should be grouped under the term *abortion*, because, up to this time, practically no regard need be paid to the life of the fœtus, which may be looked upon as practically lost.

In former times, the differences in the course of the premature interruptions of pregnancy led to a division into abortion, immature labor, and premature labor; but we no longer make the first two distinctions, because in the course of abortion occurring even in the first three months of gestation differences may be observed which are so great that, even here, one would be justified in making additional divisions and classifications. For example, some of the French writers speak of "ovular abortions," occurring in the first six weeks of gestation; "embryonal abortions," occurring from the eighth to the twelfth week of gestation; and of "fœtal abortions," occurring from the twelfth to the twenty-fourth week of gestation.

In general, we may place the time-limit of the term *abortion* at the twenty-eighth week from the beginning of the last menstrual period; but we must not lose sight of the fact, on the one hand, that fœtuses may not be viable after this time (in the first place, because the calculation of pregnancy was faulty; and, secondly, because the resisting power of the fœtus is at a low point at about the twenty-eighth week); on the other hand, that, exceptionally, a child born previous to the calculated twenty-eighth week of gestation may live. Ahlfeld[1] is among those who believe that the assumption that children born before the end of the seventh lunar month are non-viable, is entirely too arbitrary. He quotes many cases in proof of the fact that children may survive, even if born before the completion of the twenty-eighth week, and he warns us not to allow this arbitrary division to deter us from making every possible effort at our command to resuscitate a premature infant, no matter what the supposed period of gestation or development of the fœtus, so long as there are any signs of life. Lusk subsequently expressed himself to the same effect.

The marvellous results obtained in the Paris maternities, notably under Budin and Tarnier, by the use of the couveuse and gavage, show that a certain proportion of children born at the twenty-seventh, twenty-sixth, twenty-fifth, and even twenty-fourth week of gestation has been preserved. Budin claims to have saved 30 per cent. at the twenty-fourth week.

Although the period of viability has been, and may in the future be still further, reduced, under favorable circumstances, still, since the proportion of infants saved before the twenty-eighth week is as yet small, and the good results are confined to maternity hospitals; and, moreover, since our 417 cases of interrupted pregnancies falling in the first twenty-eight

weeks of gestation have all been treated in their own homes in tenement houses, where, heretofore, the use of the couveuse and gavage has not been practicable,* therefore we have seen fit still to retain the end of the twenty-eighth week as the period of viability and the point of division between abortion and premature labor.

For the foregoing reasons, and also as a matter of convenience, the Medical Board of this Hospital recently decided to classify all cases of the premature interruption of pregnancy under two main heads, as follows:

Classification of the Premature Interruption of Pregnancy.

1. Abortions.
2. Premature labors.

1. *Abortions* are those premature interruptions of pregnancy occurring before the completion of the seventh month of intrauterine gestation; namely, the first six and three-quarter months, or the first twenty-seven weeks.

2. *Premature labors* are those premature interruptions of pregnancy taking place at and after the completion of the seventh lunar month (twenty-eighth week); namely, from the twenty-eighth to the thirty-eighth week.

In this article, however, for clinical and analytic purposes, it has been deemed advisable to make a further subdivision of the 417 cases of interrupted pregnancy occurring before the completion of the twenty-eighth week, in order that a closer and more profitable study may result. So that, for purposes of convenience solely, we have divided these 417 cases falling under the definition of *abortion* into—

(1) Early abortions.
(2) Late abortions.

We include under the term *early abortion* those instances of the premature interruption of pregnancy occurring in the first three months, or twelve weeks, of uterine gestation.

Cases of *late abortion* are those falling within the period from the beginning of the fourth to the end of the seventh month. The term *premature labor* covers the remaining cases of the premature interruption of pregnancy. Our 635 cases of the premature interruption of pregnancy therefore include:

	Cases.
Early abortions	242
Late abortions	175
	417
Premature labor	218
Total	635

* Since the opening of the main Hospital building in November, 1894, premature infants, when possible, are transferred to the Hospital for couveuse treatment.

Our arbitrary division of the cases of abortion into those of early and late abortion has been made use of because, clinically, in most instances, the progress of an early abortion can be sharply differentiated from that of a late abortion. Before the beginning of the fourth month, the clinical picture presented by the emptying of a pregnant uterus is usually altogether different from an expulsion of the uterine contents subsequently.

During the first three months the ovum is expelled as a whole, or broken up, with more or less profuse hæmorrhage, hence it is that usually but a single stage of labor can be recognized; while after the third month the course of labor corresponds more nearly with parturition at term, and in most instances three stages of labor can be distinctly differentiated.

A study of our histories bears out this fact, for in the 242 early abortions we find no record of the stage of labor present when the case was first seen by the Hospital physician; while in the 175 late abortions we find fifty observations upon the stage of labor present at the time the physician from the Hospital first visited the patient.

Stage of Labor in which Late Abortions were First Visited by the Hospital.

	Cases.
Visited by the Hospital in the first stage	25
" " " " second stage	12
" " " " third stage	13
Not noted on the histories	125
Total	175

Further, it is quite true that during the emptying of the pregnant uterus in the fourth, fifth, and sixth months of pregnancy, hæmorrhage may and does occur, and the ovum may be expelled intact, yet this is the exception rather than the rule, and therefore does not militate against our arbitrary classification. Moreover, owing to the hæmorrhage which is so constantly present in the first three months, the treatment is often different, to a certain extent, from that employed after that time.

In comparing the course of labor in late abortions and premature labor, we find that, clinically, the most important distinguishing feature between the two is the course of the third stage of labor. After the end of the twenty-eighth week, the third stage of labor differs in no way from the third stage at full term; while before the seventh month, the third stage may continue days and weeks unless its course is artificially terminated. (See Treatment.)

Finally, as a matter of convenience and for clinical study, the subdivision of the term *abortion* is justifiable and desirable, because in the first three months the ovum with the placenta are often expelled together, or the escape of the fœtus is unobserved because of its minute size. Hence, there is practically no point at which we can date the onset of the third stage of labor. After the third month, and the formation of the placenta,

on the other hand, our records indicate that the third stage is a distinct period in the course of the premature emptying of the uterus.

This classification into early abortions, late abortions, and premature labors, although purely artificial, we adopt in this article because of the differences in the pathology, symptomatology, and treatment of the three groups thus designated.

For the foregoing reasons, therefore, we deem it most advisable to adopt this purely artificial division of the premature interruption of pregnancy, designating the accident occurring in the first three months, or twelve weeks, of uterine gestation an early abortion; that occurring in the fourth, fifth, and sixth and three-quarter months, or twenty-seven weeks, a late abortion; and, finally, that falling in the period from the twenty-eighth week, the generally accepted period of viability, to the thirty-eighth week, or to the time when the measurements of the fœtus are practically indicative of maturity, premature labor.

Statistical and Classification Tables.

For convenience' sake, and to further our subsequent study of these 635 cases of the premature interruption of pregnancy, we have divided them in three statistical tables, according to our definitions (see Classification and Definitions), and placed these three tables, of early abortions, late abortions, and spontaneous premature labor, respectively, at this portion of our report.

Early Abortions.—By reference to the table of our 242 cases of early abortion, it will be seen that for convenience of reference we have arranged in parallel columns the information obtained from a laborious and critical examination of each separate history chart, upon the following points:

1. Confinement number.
2. Birthplace.
3. Age.
4. Para.
5. Month of gestation.
6. Previous interruptions of pregnancy.
7. By whom delivered.
8. Character of the abortion when first seen.
9. Duration of the symptoms when first seen.
10. Previously attended by whom.
11. Condition of ovum.
12. Condition of embryo.
13. Hæmorrhage.
14. Interval between first visit by Hospital physician and operation.
15. Temperature at various periods.
16. Treatment.
17. Complications.
18. Discharge; day of puerperium and condition.

Late Abortions.—The table of the 175 cases of late abortion is arranged very much in the same manner as the preceding, only that here additional space is given for the presentation and condition of the fœtus, and for the duration and termination of the third stage of labor.

Spontaneous Premature Labor.—The plan of this table is practically a repetition of the one for late abortions, and includes 218 cases.

Threatened Abortions.—It has been thought best to leave out of this Report cases of threatened abortion, because among our earlier cases the diagnosis of the condition has in several instances been uncertain, and satisfactory histories are lacking.

Among our recent cases, however, more exact and careful observations are recorded, and this material will prove of value for a future study.

Period of Gestation.—In our abortion cases, both early and late, the period of gestation at which the accident occurred has been determined from the time that elapsed from the last menstrual period, from the size of the uterus, and from a microscopical examination of the ovum, embryo, or fœtus.

As will be observed in our tables, measurements of the ovum, embryo, and fœtus are wanting in most of our cases of early and late abortions. Unfortunately the embryos and fœtuses of our abortion cases were destroyed before the writer could obtain access to them, and the early histories lack records of weights and measurements.

In our present histories, records of the measurements and weights are entered at the time of the abortion. On the other hand, the diagnosis of the period of pregnancy in our premature labor cases has been determined partly from the duration of gestation at the time the pregnancy was interrupted, but especially from the size of the fœtus at the time of its expulsion. To this end we have taken into consideration (1) the length, (2) the weight, and (3) the measurements of the fœtal head, in the order named.

Regarding the head measurement, only the (1) great (occipito-mental) and (2) small (suboccipito-bregmatic) circumferences have been used as a sufficient index of the size.

By reference to our table of premature labors, it will be observed that in but a few instances are the above measurements lacking.

Educational Features.

During the period covered by this Report, namely, a little over five years, there have resided at the Hospital buildings 9 resident physicians, 67 assistant resident physicians, 208 graduate students, and 1,315 undergraduate pupils. It can be safely stated that each of these 1,599 individuals played a greater or lesser part in the treatment and management of the 635 untimely interrupted pregnancies here studied.

Further, as will be seen from the section on Treatment, 331 of our 635 cases were subjected to curettage; and as this operation is performed only by an attending, assistant attending, resident, assistant resident, or graduate physician, we can truthfully state that our 331 cases of curettage were performed by at least 150 different operators.

Number.	Confinement Number.	Birthplace.	Age.	Weeks Gestation.	Previous Abortions.	Previous Labors.	Miscarriage by	Character of Abortion.	Complete.	Incomplete.	Uncomplicated.	Duration of Symptoms when First Seen.	Embryo.	Length.	Weight.	Hours between Last Visit and Operation.	Temperature.	First Stage.	At Operation.	After Operation.	Highest.	Day Highest.	Continued Last Week.	Treatment.	Sponge Douche.	Uterine Douche.	Uterine Douche.	Fingers Curette.	Instrum. Curette.	Gauze Drain.	Ergot.	Gauze Drain in Brow Lung.	Complications.	Discharges.	Day Postpartum.	Condition.	Remarks.
1	27	Russia.		VIII. 2		1				1		2 days								101	3d d.	1 day		1			1					Fever; sepsis	3	Fair.	Single rise in temperature 3d day.
2	28	" "		V. 0						1		3 "																					16		
3	61	" "	24	? 3		1				1						1																	1	Fair.	
4	60	" "	40	II. 3		1				1		At once.				1																Caked breasts	12	Poor.	
5	10	U. S.	34	VII. 3		1				1		1 day				1								1		1							8	Good.	Patient up and about.
6	125	Russia.	26	V. 3		1				1		At once.																					9	"	
7	31	Germany.	32	II. 3		1				1		10 min.								101.8	3d d.	3 days		1		1		1		1		Fever; sepsis	11	"	Caked breasts.
8	123	Russia.	30	III. 3		1				1		"																					11	Anem.	
9	132	" "	30	VII. 3		1				1		"																					11	Anem.	Attended by outside physician.
10	155	U. S.	30	X. 3		1				1		13 hours																					6	Good.	
11	166	" "	30	XI. 3		1				1		1 day												1		1							8	Fair.	
12	201	Germany.	30	III. 3		1				1		14 "																					3	Good.	Instruments in former labor.
13	218	England.	30	VIII. 3		1				1		"						100.8		99		1 day		1		1		1				Fever; sepsis	3	"	
14	79	" "	32	VI. 3		1				1		"																					5	"	
15	257	Russia.	32	IV. 3		1				1		3 days																					6	"	
16	264	U. S.	30	V. 3		1				1		"												1									10	"	
17	10	Russia.		I. 3								"																					1	"	
18	124	U. S.	34	VII. 3		1				1		2 "				1																	1	?	Only one visit; abortion 1 hr. before.
19	142	" "	30	III. 3		1				1		1 "																					8	Good	
20	147	" "	30	III. 3		1				1		6 "																1		1			8	"	
21	167	Russia.	30	III. 3		1				1		3 "																					8	"	
22	58	" "	30	III. 3		1				1		24 "																					8	"	
23	63	Ireland.	30	V. 3		1				1		"																					8	"	
24	101	Russia.	30	V. 3		1				1		"																					8	"	
25	103	Austria.	30	VII. 3		1				1		6 hours																				Indium, of arm and breast	11	"	Collapse from hemorrhage when seen.
26	122	Russia.	30	IV. 3		1				1		1 week				1												1				Fever; sepsis	10	"	No fever after uterine irrigation.
27	131	" "	30	IV. 3		1				1		11 days						101.2				1 day				1							21	"	
28	146	" "	30	V. 3		1				1		14 day																					4	"	
29	148	" "	30	VI. 3		1				1		1 "																					10	"	
30	206	Russia.	30	V. 3		1				1		3 weeks																					6	"	
31	208	Poland.	30	IV. 3		1				1		3 days																					8	"	
32	80	Austria.	30	IV. 3		1				1		1 "																					8	"	
33	90	Germany.	30	V. 3		1				1		"																					8	"	
34	69	Russia.	30	V. 3		1				1		1 week				1																	8	"	
35	93	" "	30	V. 3		1				1		"																					8	"	
36	95	" "	30	V. 3		1				1		1 "																					8	"	
37	96	" "	30	III. 3		1				1		12 days								100.5	100 3	3d d.	2 days									Fever; sepsis	13	Fair.	
38	104	" "	30	V. 3		1				1		1 "						103	103				1 day									Fever; sepsis; anuria; weak pulse; rales; weak	14	Bad.	Hematemesis; declined to enter hospital; anemic.
39	120	U. S.	30	XIV. 3								1 day																					3	Good.	
40	154	" "	30	V. 3		1				1		1 "																					4	"	
41	162	Russia.	30	V. 3		1				1		4 days																					8	"	
42	59	" "	30	VI. 3		1				1		1 week																					8	"	
43	66	" "	30	V. 3		1				1		2 weeks																					8	"	
44	76	" "	30	V. 3		1				1		"																					10	"	
45	116	" "	30	V. 3		1				1		8 days																					7	"	
46	146	Austria.	34	VII. 3		1				1		12 hours						101.2		101.4	104	1st d	3 days									Fever; sepsis	10	"	
47	150	Russia.	30	III. 3		1				1		4 days																					7	"	
48	240	" "	30	X. 3		1				1		2 "																					7	"	
49	254	" "	30	III. 3		1				1		"																					8	"	
50	126	" "	30	III. 3		1				1		"																					8	"	
51	127	" "	30	III. 3		1				1		4 "																					5	"	
52	211	Germany.	30	IV. 3		1				1		6 hours						N. R.	N. R.	101	3	1 L. d.	3 days									Fever; pneumonia	11	"	
53	70	Russia.	30	VI. 3		1				1		12 days																					4	"	
54	135	Ireland.	30	VI. 3		1				1		6 hours																					1	Fair.	
55	246	Austria.	30	VI. 3		1				1		2 days																					5	Weak	
56	45	U. S.	30	VII. 3		1				1		3 "																					3	Fair.	
57	59	" "	30	III. 3		1				1		4 "																					10	Good.	
58	60	Ireland.	30	XI. 3		1				1		"																					4	"	
59	249	" "	30	III. 3		1				1		1 day						98.5		101.8	3d d	3 days										Fever; sepsis	10	Imp.	Midwife in attendance.
60	253	Russia.	30	III. 3		1				1		At once.																					8	Good.	
61	255	" "	30	III. 3		1				1		"																					8	"	No record of previous abortion.
62	256	" "	30	IV. 3		1				1		"																					6	"	" " "
63	259	" "	30	XIV. 3		1				1		6 "																					7	"	" " "
64	270	England.	30	X. 3		1				1		2 weeks																					9	"	Instruments in former labor.
65	272	Russia.	30	III. 3		1				1		"						100 8	100 8	99 6		Few hrs										Fever; sepsis	1	"	
66	273	" "	30	III. 3		1				1		3 days									101	1st d	4 day										Anæmic fever; unknown cause; caked breasts	7	Imp.	
67	227	England.	30	VI. 3		1				1		3 weeks						N. R.	N. R.	100.5	100 5	L. d.	Few hrs									Fever; unknown cause	10	Good.	
68	250	Roumania.	30	V. 3		1				1		2 days																				Anteversion of uterus	8	"	
69	247	Russia.	30	III. 3		1				1		1 week																					8	"	Instruments in former labor.
70	240	Germany.	30	II. 3		1				1		1 day																				Os very small	6	"	
71	236	Russia.	30	V. 3		1				1		4 days																				Weak and anæmic	6	"	
72	230	" "	30	VIII. 3		1				1		4 "																					5	"	
73	220	Germany.	30	X. 3		1				1		At once																					4	"	
74	219	Russia.	30	V. 3		1				1		"						N. R.	N. R.		102.7	8th d.	4 days										Fever; sepsis; pleurisy	11	Fair.	No fever after 8th day.
75	209	" "	30	V. 3		1				1		3 days																					10	Good.	
76	206	Russia.	30	III. 3		1				1		19 "																					8	"	
77	203	Austria.	30	III. 3		1				1		2 "																					2	Fair.	
78	193	Russia.	30	V. 3		1				1		1 day																					1	"	Consultation case.
79	191	" "	30	V. 3		1				1		1 "																					8	"	
80	170	" "	30	IV. 3		1				1		6 days																					10	Good.	
81	197	" "	30	IV. 3		1				1		4 day																					4	"	
82	86	" "	30	III. 3		1				1		"																					8	"	
83	278	" "	30	III. 3		1				1		"																					8	"	
84	96	" "	30	IV. 3		1				1		3 days																					7	"	
85	156	" "	30	IV. 3		1				1		3 "																					8	"	
86	157	" "	30	IV. 3		1				1		3 days						98 1			102	1st d.	N. R										Fever; sepsis	8	"	
87	158	" "	30	IV. 3		1				1		At once																					8	"	
88	159	" "	30	X. 3		1				1		3 hours																					8	"	
89	160	" "	30	X. 3		1				1		5 days																					8	"	Instruments in former labor.
90	161	" "	30	V. 3		1				1		1 day																					8	"	Has chronic Bright's disease.
91	163	U. S.	30	IX. 3		1				1		2 weeks																					8	"	
92	164	Poland.	30	IX. 3		1				1		11 day																					8	"	Tumor of large size in os.
93	178	England.	30	VIII. 3		1				1		"									100	101 5	L. d.	Few hrs									Fever; unknown cause	8	"	Craniotomy in former labor.
94	225	Russia.	30	V. 3		1				1		"																					8	"	
95	362	" "	30	V. 3		1				1		2 days																					8	"	
96	363	U. S.	30	V. 3		1				1		1 day																					8	"	
97	852	Russia.	30	V. 3		1				1		"																					4	"	
98	853	Ireland.	30	V. 3		1				1		2 "																					6	Imp.	
99	1,064	Russia.	30	V. 3		1				1		3 "																					8	Good.	
100	1,066	U. S.	30	V. 3		1				1		1 week																					6	"	
101	1,034	" "	30	III. 3		1				1		1 day																					8	"	
102	1,059	Russia.	30	III. 3		1				1		"																					7	Imp.	
103	4,059	" "	30	XIV. 3		1				1		3 days																					10	Good.	
104	4,096	" "	30	V. 3		1				1		"																					8	"	
105	4,127	" "	30	V. 3		1				1		4 "																					8	"	
106	4,129	" "	30	V. 3		1				1		1 day																					8	"	
107	4,161	" "	30	V. 3		1				1		3 days																					8	"	
108	4,165	" "	30	V. 3		1				1		3 "																					8	"	
109	4,172	" "	30	V. 3		1				1		3 "																					8	"	
110	4,179	" "	30	V. 3		1				1		4 hours																					8	"	
111	4,236	" "	30	V. 3		1				1		"																					8	"	
112	4,242	" "	30	V. 3		1				1		2 days																					8	"	
113	4,270	" "	30	V. 3		1				1		10 hours																					8	"	
114	4,283	U. S.	30	I. 3								"						99	99	99	101.4	1st d	Few hrs									Fever; pulmonary tubercul	4	"	

N. R. = No record; L. d. = Labor day.

EARLY ABORTIONS.—(CONTINUED.)

Number.	Confinement Number.	Birthplace.	Age.	Para.	Months of Gestation.	Previous Abortions.	Hæmorrhage.	Previously Delivered at Term.	Convulsions.	Cord round Neck.	Presentation.	Duration of Symptoms when Seen.	Urgency.	Previously Operated on.	Lacer. Cervix.	Death.	Embryo. Length.	Weight.	Hæmorrhage. Before Treatment.	Hæmorrhage. After Treatment.	Time between First Visit and Operation.	Temperature. First Seen.	At Operation.	After Operation.	Highest.	Day Highest.	Compound Low Daily.	Treatment. None.	Vaginal Douche.	Uterine Douche.	Finger Curette.	Instrum. Curette.	Gauze Drain in Uterus.	Gauze Drain in Vagina.	Gauze Drain in Rectum.	Gauze Drain in How Long.	Complications.	Day Instrument.	Discharged. Condition.	Remarks.
124	4,327	Hungary	30	X	2																At once.																		
125	4,534	Austria	32	VI	3							3 days									"																		
126	4,536	Croatia	37	IV	3							6 "									"																		
127	4,494	"	34	III	3							"									"																		
128	4,468	"	34	IX	3							3 "									"																		
129	4,466	"	20	I	3							9 "									"																		
130	4,587	"		V	3							3 "									"																		
131	4,581	"	37	IV	3	1						1 hour									"																		
132	4,547	"	37	II	3							5 days									"																		
133	4,574	"	29	II	3							10 "									"																		
134	4,594	Ireland	27	VI	3							3 "									"																		
135	4,619	Austria	30	II	3							2 "									"																		
136	4,619	Russia	30	II	3							"									"																		
137	4,665	"	32	VII	3							"									"																		
138	4,685	"	36	VIII	3							1 day									"																		
139	4,715	"	25	IV	3							1 "									"																		
140	4,723	"	28	III	3							"									"																		
141	4,757	"	33	III	3							"									"																		
142	4,807	"		VI	3							6 days									3 days																		
143	4,852	"		X	3							1 day									"																		
144	4,855	"	43	VI	3							2 days									At once																		
145	4,909	Germany	34	II	3							"									"			98 5	100 8	4th d.	Few hrs.		1	Drn	1						Fever; unknown cause.			
146	4,920	Russia	34	II	3							4 "									"																Profuse hæm., antepartum			Up, and refused further treatment.
147	4,919	"		II	3							"									"																		
148	4,919	"		II	3							"									1 day																		
149	4,931	"	24	XX	3							"									At once.																		
150	4,936	"	36	X	3							"									"																		
151	5,004	Hungary	30	III	3							5 days									"																		
152	5,009	America	31	II	3							3 "									"																		
153	5,011	Russia	28	III	3							6 "									"																		
154	5,011	"		II	3							"									1 day																		
155	5,009	Germany	22	I								2 weeks.									At once																		
156	5,096	Russia	31	VIII	3							3 days									"																		
157	5,057	"	35	III	3							1 "									"																		
158	5,055	"		II	3							"									"																		
159	5,060	"	37	IV	3							2 days									"																		
160	5,057	"		II	3							"									"																		
161	5,060	"		II	3							12 "									"																		
162	5,053	"	46	XII	3							2 weeks.									"																		
163	5,085	Germany	30	VIII	3							3 days									"																		
164	5,100	Russia	43	VIII	3							"									"																		
165	5,041	"		II	3							"									"																		
166	5,045	"	44	X	3							1 day									"	101	101	102.2	104 8	1st d.	N. R.									Fever; septicæmia			(N. R. on cutette.)
167	5,048	Russia	37	III	3							15 hours									"																		
168	5,041	"		II	3							1 days									"																		
169	5,041	"	24	II	3							3 days									"																		
170	5,059	"	23	II	3							At once.									"																		
171	5,059	Hungary	28	IX	3							"									"																		
172	5,059	U. S.		I	3							6 "									"																		
173	5,041	Ireland	31	XI	3							1 day									"	N. R.			101.2	102.2	1st d.	2 days									Fever; sepsis			Temp. normal in 48 hrs. from curettage
174	5,066	Germany	31	II	3							"									At once.																			Intermittent bleeding for days.
175	5,078	Russia		I	3							"									"																		
176	5,063	"	30	I	3							3 days									"																		
177	5,094	?	?	?	?							"									"																		
178	5,102	"		V	3							2 days									3 hours			100.5	100.4														
179	5,102	"		II	3							4 "									"																		
180	5,098	Russia	28	III	3							At once.									"																		
181	5,098	"		II	3							"									"																		
182	5,098	"		II	3							"									"																		
183	5,098	"		II	3							"									"																		
184	5,098	"		II	3							"									"																		
185	5,120	Germany	31	V	3							3 days									At once																		
186	5,123	Ireland	30	II	3							"									"																		
187	5,123	Russia	34	I	3							"									"																		
188	5,146	"	32	I	3							1 day									"																		
189	5,146	"		II	3							"									"																		
190	5,153	"		II	3							3 days									"																		
191	5,153	"		II	3							2 "									"																		
192	5,153	"		II	3							1 day									"																		
193	5,153	"		II	3							2 days									"																		
194	5,153	"		II	3							1 "									"																		
195	5,153	"		II	3							"									At once.																		
196	5,153	"		II	3							"									"																		
197	5,153	"		II	3							5 hours									"	N. R.	N. R.	N. R.	101.4	103	5th d.									Fever; pneumonia			Membrane adherent; placenta friable.
198	5,153	"		II	3							"									"																Collapse of patient			
199	5,153	"		II	3							"									"																		
200	5,153	"		II	3							"									"																		
201	5,153	Russia	30	IV	3							3 days									"																		
202	5,153	"		II	3							"									"																		
203	5,153	"		II	3							"									"																		
204	5,153	"		II	3							"									"																		
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Number.	Confinement Number.	Birthplace	Age.	Para.	Previous Abortions.	Previous Miscarriages.	Previous Hospital.	Delivered by Instruments.	Stage of Labor First Seen.	Duration of Symptoms when First Seen.	Previously Attended by Outside Physician.	Previously Attended by Midwife.	Fœtus. Not Found.	Length.	Weight.	Cephalic Pres.	Pelvic Pres.	Transverse Pres.	Still-Born.	Macerated.	Lived How Long.	Placenta. Spontaneous.	Expressed.	Adherent.	Broken Up.	Duration of Third Stage of Labor.	Hæmorrhage. Before Treatment.	Hæmorrhage. After Treatment.	Time Between First Visit and Operation.	Temperature. First Seen.	Temperature. At Operation.	Temperature. After Operation.	Temperature. Highest Temp.	Temperature. Day of Highest Temperature.	Temperature. Continued How Long.	Treatment. None.	Vaginal Douche.	Uterine Douche.	Finger Curette.	Instrum. Curette.	Gauze Drain.	Ergot.	Gauze Remained How Long.	Discharged. Day of Postpart.	Discharged. Condition.	Complications.	Remarks.
1	8	Germany	29	IV. 4			1			6 days			1						1						1		1	1	At once.								1		1				7	Good		
2	60	Russia	24	V. 4		1		1		8 "			1						1						1		1	1							1							3	Fair	Retroflexed / Retroverted uterus	No fever.
3	64		27	III. 4			1			Sev. wks.			1									1			1		1	2 weeks	N. R.		101		Few hrs.		1	1		1		1	10	"	Sepsis; cardiac nephritis	
4	120	U. S.	32	II. 5			1			2 weeks	1		1						1			1			1		1						"							8	"	Caked breasts.	
5	215	"	33	XI. 5		1		1			1								1						1		1	1 day	103.5			103.5		"	1	1		1			7	Good	Foul lochia	Sepsis.
6	283	Hungary	30	V. 4			1			1 week		1	1						1			1			1		1	At once.	100.6	100.6	101.1			1 day	1	1		1			6	"	Fever; sepsis	Temperature after curettage normal.
7	339	Austria	40	X. 6			1			1 week	1	1							1	1																				1	"	Case left to midwife.	
8	491	Russia	35	VII. 6			1			3 days									1						1																1	"	Postpartum hemorrhage.	[fuse & foul for 6 days.
9	497	"		I. 6				1									1		1												101	4th d.	3 days	1							10	Weak	Sepsis; hæmorrh. 9th d.; fever	Normal temp. on 7th d. & on; head extraction; lochia pro-
10	455	U. S.	30	II. 6																																							Refused treatment; 2d stage.
11	490	Russia	36	IV. 4			1															1			1									"							4	Good		
12	496	"	36	VIII. 4						2 hours			1									1			1			12 hrs						"							10	"		
13	493	"	33	IV. 4			1			12 days			1		1½ lbs.							1			1									"							3	"		
14	567	Austria	29	II. 6			1					1							1		1					25 "						100.8	1st "	1 day							8	"	Fever; bronchitis	Anencephalic child.
15	580	Russia	22	I. 4			1					1											1									101.4	2d "	1 "							9	"	Fever; sepsis.	
16	612	Austria	23	II. 4	1	1						1							1																						9	"		
17	633	Russia	21	II. 4																																						7	"		
18	720	Ireland	28	II. 6			1		1												Few min.	1																			10	"	Postpartum case.	
19	733	Russia	20	III. 4			1			4 hours			1																												9	"		
20	760	"	32	I. 4			1			3 weeks			1																												7	"		
21	881	Poland	34	VII. 4	2		1						1															1 hr	101.4	101.4	103.4			?		1	1		1					"	Fever; unknown cause	Case turned over to private Dr. immediately after oper.
22	888	Russia	27	II. 4			1						1															11 hrs								1	1				9	"		Placenta with fingers and curette.
23	896	"	22	I. 4			1			3 days									1									At once.								1		1				6	"		
24	906	"	22	I. 4			1			8 "			1									1														1		1				9	"		
25	941	"	35	VI. 6			1		1	2 weeks	1								1				1					"	N. R.	N. R.		100.6	L. d.	1 day		1		1			1	10	"	Fever; cause unknown	Fatty degeneration of placenta.
26	999	"	27	II. 6			1												1				1					"				104	1st "	3 days							1	10	"	Fever; sepsis	Twins; podalic version; plac. previa; accouchement forcé.
27	974	"	21	III. 4	1	1							1						1				1					"								1		1				9	"		
28	1,023	U. S.	19	III. 4	1	1							1						1				1					"								1	1	1				8	"		
29	1,055	Russia	26	II. 4			1																1	1				"				98.8	103	5th "	2 "			1	1			12	"	Fever; sepsis	Out of bed 12th day.
30	1,177	"	26	III. 4			1			7 days	1		1						1				1					"				104	104	104			3 "		1	1	1			9	"	Fever; sepsis.	
31	1,196	"	30	I. 5			1												1									"								1	1	1				9	"		
32	1,198	Russia	36	V. 6						12 hours	2												1	1		5 "		"													11	"	Death from shock	Placenta prævia; death of mother; rupt. uterus; pod. version.
33	1,267			6			1												1									"				102	5th "	Few hrs.		1						11	"	Fever; constipation	Postpartum case; ovum delivered intact.
34	1,300	Ireland	37	VIII. 4			1												1				1					"								1		1				11	"		
35	1,340	Germany	28	IV. 5	1		1			3 days									1				1					2½ hrs								1		1				9	"		
36	1,326	Austria	24	II. 4			1						1										1					"								1		1				8	"	Fever; constipation	Only temperature rise, 3d day; no fever after.
37	1,344	Russia	28	IV. 5			1						1										1					"									1	1				10	"		
38	1,522	"	23	IV. 4			1												1				1					"									1	1	1			5	"		
39	1,534	U. S.	38	V. 6		1		1		4 "				12 in.	2 "	1					Few hrs.		1			45 "		At once.														8	"		Child died soon after birth.
40	1,555	Russia	34	VI. 4		1				6 "							1						1			30 "		"											1		9	"		
41	1,581	"	20	III. 6			1		1					14 "	1½ "				1									"														9	"		
42	1,439	Roumania	32	VIII. 5			1												1									"														2	Weak		Private doctor called in.
43	1,445	Russia	38	VIII. 4	1	1	1			24 hours			1										1					"								1	1	1				10	"		
44	1,455	"	20	I. 6			1		1								1				Few hrs.	1			1			"								1		1				8	Good	Caked breasts	Child died 1st day.
45	1,462	Roumania	21	II. 5			1												1			1						"								1						6	"		
46	1,467	Russia	23	II. 5			1												1			1						"								1						9	"		
47	1,468	"	30	V. 5			1			2 days			1						1				1					"									1	1							Patient sent to Gouverneur Hospital; no fever.
48	1,470	"	44	V. 3	4		1												1									"														5	"		
49	1,496	U. S.	37	VII. 3			1			1 day									1									"								1	1	1				5	"		
50	1,624	Russia	21	III. 3			1			3 days									1									"									1	1				8	"		
51	1,658	"	21	I. 4			1												1									"								1	1	1				10	"		
52	1,682	"	21	IX. 4			1			2 weeks									1									"				99	99	102	102	L. d.	"		1	1				10	"	Fever; sepsis.	
53	1,688		27	III. 4			1												1									"														10	"		Hydatiform mole; no complications.
54	1,707	Roumania	24	I. 5			1												1									"														9	"		
55	1,295	"	34	III. 4			1			1 day									1									"				103	103	103	103	L. & l.	2 days		1	1	1			2	Weak	Fever; sepsis	Parametritis; sent to Gouverneur Hospital; treated
56	1,518	Russia	32	VIII. 4		1													1			1	1 day					"								1		1				5	Good		there 3 days for pelvic cellulitis.
57	1,854	"	27	V. 5		1		1											1				At once.					"								1		1				9	"		
58	1,922	"	40	I. 6			1		1					14 "	2 "	1					Few hrs.	1			1	8 "		"				101.8	5th d.	4 "						1		7	Fair	Fever; sepsis.	Caked breasts; child lived a few hours.
59	1,930	"	40	XI. 6			1							13 "						1			1			25 "		"														11	Good		
60	2,022	U. S.	19	I. 5			1												1									"								1		1			1	3	"		
61	2,102	Russia	32	I. 4		1											1	1				1						"														10	"	Fever; sepsis.	No subsequent fever.
62	2,225	"	19	I. 6		1			1										1				1			20 "		"														8	"		
63	2,262	"	38	VII. 5	2		1												1									"														9	"		
64	2,357	"	26	IV. 5			1												1									"								1	1	1				9	"		
65	2,300	"	36	II. 4			1			6 days			1										1					"														9	"		
66	2,383	"	24	V. 4			1						1										At once.					"														8	"		
67	2,462	U. S.	28	III. 5	1		1		1										1				"			1 hr. 20 m		"								1		1		1		11	"		
68	2,216	Russia	25	VII. 4	1		1		1				1	10½ "	1½ "				1			1						"														12	"	Fever; sepsis;	albuminuria	Curetting on 4th day; no fever after; all her children
69	2,235	U. S.	28	V. 5		1		1										1					1			4 days	104.6			105.4	4th "	4 "		1	1	1	1			8	"		born dead.
70	2,465	Russia	36	IV. 5			1												1				At once.					"								1	1	1				9	"		
71	2,980	"	28	VI. 3			1						1										1					"								1		1				8	"		
72	3,004	"		V. 4	3	1													1				"					"								1		1							Child lived a few minutes.
73	3,023			6			1												1		Few min.																							
74	3,119	"	30	X. 4	3	1							1						1				"					"														9	"		
75	3,271	"	32	VII. 3		1							1						1				"					"														7	"		
76	3,296	"	25	IX. 4		1				2 weeks									1				"					"														8	"		
77	3,445	"	34	IV. 4			1						1						1				"					"														9	"		
78	3,473	"	35	VIII. 4	3	1							1						1				"					"														9	"		
79	3,485	Germany	25	6			1												1				"					"														10	"		Midwife had decapitated, and torn off leg; curetted; small
80	3,533	England	38	XII. 5	5	1							1						1				"					"														8	"		pieces placenta obtained.
81	3,597	Russia	24	III. 4		1							1						1				"					"														8	"		
82	3,632	"	25	IV. 5			1			4 days									1				"					"														8	"		
83	3,700	"	26	V. 3	1		1												1				"					"														9	"		
84	3,803	U. S.	34	VII. 3	1		1		1										1				"					"														9	"		
85	3,885	Russia	28	IV. 4			1			6 days			1									1					1	1	16 hrs	101.2		100	100.6	1st "	1 day		1	1	1	D'n	1		3	"	Fever; sepsis	Slight hæm. after oper.; refused further treatment 3d day;
86	3,894	"	36	IV. 5	2	1	1			12 hours									1				1 day																				8	"		syphilis; ulceration in pharynx; cardiac emphys.
87	3,954	"	33	V. 4		1		1											1				At once.																				9	"		
88	3,974	"	31	III. 4	1	1		1		1 month									1				"																				9	"		[sent to hospital.
89	3,985	"	19	I. 5			1		1	12 hours									1				"																				3	"		Everything came away intact; vag. douche only given;

N. R. = No record; L. d. = Labor day.

Number.	Confinement Number.	Birthplace.	Age.	Para.	Fœtus: Month of Gestation.	Fœtus: Previous Abortions.	Fœtus: Previous Miscarriages.	Fœtus: Previous Hospital.	Delivered by: Unattended.	Stage of Labor First Seen.: 1st Stage.	Stage of Labor First Seen.: 2d Stage.	Stage of Labor First Seen.: 3d Stage.	Duration of Symptoms When First Seen.	Previously Attended by: Outside Physician.	Previously Attended by: Midwife.	Fœtus: Not Found.	Fœtus: Length.	Fœtus: Weight.	Fœtus: Cephalic Pres.	Fœtus: Pelvic Pres.	Fœtus: Shoulder Pres.	Fœtus: Still-Born.	Fœtus: Macerated.	Fœtus: Lived How Long.	Placenta: Spontaneous.	Placenta: Expressed.	Placenta: Man. Ext. by Hosp.	Placenta: Broken Up.	Duration of Third Stage of Labor.	Hæmorrhage: Before Treatm't.	Hæmorrhage: After Treatment.	Time Between First Visit and Operation.	Temperature: First Seen.	Temperature: At Operation.	Temperature: After Operation.	Temperature: Highest Temp.	Temperature: Day of Highest Temperature.	Temperature: Continued How Long.	Treatment: None.	Treatment: Vaginal Douche.	Treatment: Uterine Douche.	Treatment: Finger Curette.	Treatment: Instrum. Curette.	Treatment: Gauze Drain.	Treatment: Ergot.	Gauze Remained How Long.	Discharged: Day of Postpart.	Discharged: Condition.	Complications.	Remarks.
90	4,052	Russia	25	II. 4									1 day										1		1				At once.														7	Good.		
91	4,102	"	33	VI. 5				1	1				1 hour		1							1	1		1				"														8	"		Placenta remarkably fatty.
92	4,107	"	36	VIII. 5									13 hours										1		1				"														5	"		
93	4,198	"	37	IV. 6					1				7 weeks										1		1				2 hrs.				101.8	1st d.	1 day								7	"	Fever; *sepsis*	Hydrocephalus; no curetting; plac. almost entirely fatty.
94	4,242	"	31	I. 5																			1		1				"		98.5		101.4	4th "	Few hrs.								7	"	Fever; *sepsis*	Single rise in temp. 2d and 4th day; ont of bed 6th day.
95	4,284	U. S.	18	I. 5				1															1		1				5 "														8	"		
96	4,309	Russia	40	VIII. 4			1						2 days										1		1				12 "				101.2	101.2	6th "	"							9	"	Fever; *constipation*	Single rise in temp. after operation, on 6th day; bleeding during entire pregnancy.
97	4,320	"	28	II. 3		1	1																1		1				"														9	"		Extraction of breech.
98	4,597	"	22	IV. 6		1		1									14 inch.	2 lbs.			1		1						At once.														7	"		
99	4,608	England	35	VIII. 5		3	1						3 "										1		1				"														6	"		
100	4,672	Russia	27	IV. 5																	1		1						"														10	"		
101	4,774	"	23	II. 4					1				3 "								1		1						"		100.5	100.5	101.2	102	2d "	2 days							6	"	Fever; *sepsis*.	
102	4,824	Italy		VIII. 4	6			1							1														"														6	"		
103	4,906	Poland	36	X. 3					1				18 hours		1								1						"														6	Fair	Hæmorrhage; *anæmia*	Woman *starving*; fœtus membranes removed intact with dressing forceps.
104	4,910	Russia	25	IV. 3	1		1						1 day										1						"														6	Good		
105	4,919	"	25	II. 3	1		1						2 weeks										1						"														7	"		
106	5,042	Austria	34	IV. 5	1		1						2 "		1								1						"														7	Impr.	Constip.; hysteria; lochia serous, mod.; slight odor.	
107	5,044	Russia		4									6 hours									1	1						"		102	102	100.4	102	L. "	Few hrs.		1	1	D'l	1			4	Good	Fever; sepsis	No subsequent fever; out of bed 3d day.
108	5,051	"	30	IV. 5					1				3 days										1						"				102.6	1st "	"			1	1				5	"	Fever; unknown cause	No fever after 1st day.
109	5,152	"	23	III. 5					1				3 "										1						"														4	"		
110	5,219	"	21	I. 4				1															1						"		100.6	100.6	100.6	100.6	1st "	"		1	1		1			7	"	Fever; sepsis	Patient discharged in apparently good condition; 2 weeks later again seen, treated, finally sent to hospital; parametritis.
111	5,242	"	25	III. 44			1		1				1 day				14½ cm.						1						"									1	1				4	"		
112	5,290	"	20	III. 6		1	1														1		1						"									1	1				8	"		
113	5,298	Roumania	28	VII. 6			1																1						"														6	"		
114	5,318	Russia		III. 64			1						4 weeks										1						"									1	1				6	"		Lacerated cervix.
115	5,330	"	36	II. 5		1	1		1								8						1						"														6	"		
116	5,388	"	37	VIII. 4		1	2									1							1						"														7	"		
117	5,389	"	22	VII. 5		1	1									1							1						"														7	"		
118	5,463	"	30	I. 5		1										1							1						"														7	"		
119	5,478	"	21	I. 34		1							14 days			1							1						"									1	1				7	"		
120	5,575	"		4			1		1		1		4 "										1						"														7	"		[one fœtus mummified.
121	5,635	"	29	V. 5				1				1										30 min.	1			1			"				101	3d "	"		1	1	2 days.	9	"	*Caked breasts; fever*	No fever, excepting 3d day; single rise in temp.; twins;
122	5,647	"	28	III. 6									3 "		1								1						"	101.4					L. "	"		1	1	D's.	1	1	5	"	Fever; *sepsis*	No subsequent fever.
123	5,656	"	25	III. 4		2		1	1				1 day										1						5 days	N. R.	102.4			102.4	L. "	"		1	1	1	1			6	"	Fever; *sepsis*	" " "
124	5,657	"	25	II. 4		1		1	1														1						"									1	1				3	"		
125	5,660	U. S.	31	I. 6		2		1	1				2 days								1		1						"														6	"		
126	5,685	"		II. 4				1	1				3 "										1						"									1	1				5	"		Fœtus by volsellum forceps.
127	5,737	Russia	25	I. 4				1	1				3 "										1						"									1	1				7	"		Fœtus by dressing forceps.
128	5,769			6						1		1				1							1						"														6	"		
129	5,782	Germany	24	4				1	1		1		12 hours		1								1						"		101.2	101.2	100.8	100.8	1st "	1 day		1	1	1	5	"		7	"	*Fever; sepsis*	1st & 2d stage together; susp. crim. abortion; no subseq. fever.
130	5,880	Russia	30	VI. 4									3 days			1							1						At once.									1	1				3	"		Umbilical hernia in patient.
131	5,927	"	36	IV. 5									3 "								1		1						7 hrs.														10	"		
132	6,008	Austria	29	IV. 64			1		1								12½ in.	5 "		1		1	1				1		15 "														10	"		
133	6,142	U. S.	33	VI. 6	4	1			1														1						At once														8	"		Adherent membranes.
134	6,371	Germany	36	IX. 5	3																		1						At once.									1	1	1	2	"	7	"		
135	6,385	Russia	36	IV. 5									2 weeks					1					1						35 min	1	101.5	101.5	101.5					1	1	D'l	1	1	4	"	6	"	Sepsis; prolapsed cord; fever	No subsequent fever. [no fever after 1st day.
136	6,562	"	20	I. 54		1			1								9½ "	1½ "		1			1						2 hrs. 10 m.	1	101			102	L. "	1 "							8	"	Unknown cause; *fever*	Cause of fever not known; child lived about 5 minutes;
137	6,674	"	22	II. 5		1			1				5 min										1						1 hr. 20 m	1								1					11	"		Lochia scant; serosang.
138	6,702	"	24	III. 64		1			1								13 "	2½ "		1			1						35 min														4			Refused treatment on 4th day.
139	6,743	"	30	IX. 6	1		1																1						15 "														7			
140	6,862	"	36	V. 6		1	1																1						"														6			
141	6,909	Germany	19	II. 4																			1						"														9	"		Cultures refused.
142	6,915	Russia		IV. 4									12 hours										1						"														10	"		
143	7,034	"	34	III. 4		2	1						1 week										1						"		101	99.5			Few hrs.			1	1		1		5	"	Fever; sepsis	Woman anæmic; complaining of pains in back, etc.
144	7,072	"	32	VIII. 6				1															1						"									1	1				4	"		Scrapings for examinations.
145	7,098	"	25	III. 6					1							1							1						5 "														11	"		Record of child missing.
146	7,107	"	30	VI. 4					1							1							1						"														5			Placenta previa suspected in pregnancy; not verified.
147	7,199	"		VIII. 5				1					3 weeks		1	1							1						"									1	1				16	"	Uterus retroflexed	Temp. 100 on 1st, 2d, 10th, and 12th days.
148	7,269	"	30	VI. 64					1								13 "	2 "		1		1	1						20 "				103.4	11th"	8 days								8	"	Fever; *caked breasts*	Fœtus found in unruptured.
149	7,406	"	27	IV. 5					1								9 "	6 oz.					1						1 hr														11	Bad		Child took only one breath; lochia never offensive; private physician called in; *late sepsis*.
150	7,465	"		34		4			1														1						3 hrs														6	Good	Postpartum hæmorrhage	Ether; digest. of membr. & plac.; removal of pieces of membrane with curette; out of bed 5th day.
151	7,571	"	38	VIII. 4		1			1							1							1						19 "														9	"		
152	7,632	"	22	IV. 44	1	4			1							1							1						"														7	"		
153	7,679	U. S.	30	V. 34					1				4 days			1							1						6 "		101.2	101.2	101.2	102.8	2d "	14 "			1				15	Bad	*Fever*; sepsis; pericarditis	Sent to St. Francis' Hospital.
154	7,683	Russia	27	II. 54					1							1							1						"														7	Good		
155	7,693	"	38	III. 4				1															1						"									1	1				3	"		
156	7,751	Poland	21	5				1															1						"														7	"		
157	7,907	Russia	38	III. 64				1									13 "	3 lbs.		1			1						1 day														18	Fair	Endocarditis	Incubator child; child disch. living; died later, hydrocephl; double mitral ascites; hepatic congestion.
158	8,023	"	37	XI. 5	1	1		1															1						25 "														10	"		No further record.
159	8,087	Roumania	28	IX. 44	2			1					Sev. wks.										1						"														6	Good	Fever; constipation	Manual extraction of clots from uterus.
160	8,160	Russia	30	VI. 5				1					4 hours										1						Not obs		Immed			101.2	8th "	Few hrs.		1	1	1	1	2 days.	10	Good		
161	8,249	"	32	IV. 5	8																		1						"									1	1		1		7	"		
162	8,405	U. S.	25	VIII. 5		3	1		1								10½ "	1½ "		1			1						30 min		"									1	1 day	7	"		
163	8,536	"	38	XIII. 5		2	1																1						"														10	Fair	Head caught in os; convulsions 7th and 10th day.	
164	8,643	"	27	IV. 5			1																1				Retained																	Curettage refused; discharged.
165	8,743	Ireland	28	II. 5			1																1					1	3 hrs. 5 m		1							1	1				9	Good		Manual removal of placenta and membrane.
166	8,771	Russia	29	V. 4			1											27 grms.					1					1																8	"		Manual extraction of fœtus, placenta, and membrane.
167	8,871	"	34	IX. 4		4		1															1						"											1	1	"	7	"		
168	8,872	U. S.	16	I. 5								1				Twins		(223 "					1						5 days				101	4th "	3 days			1	1	2 days.	9	"		Uterine douche prevented by contracted os.
169	8,953	"	29	V. 5		4	1		1									(216 "			1	1	1																				10	"	Fever; sepsis.	
170	9,110	Russia	22	I. 6			1																1																				8	"		
171	9,388	"	31	7	6	4			1							1							1																				4	"	Macerated child	Breech presentation; monstrosity.
172	9,431	"	40	VI. 5			1		1														1						At once.									1	1				9	"	Head caught in os	Slight digital dilatation.
173	9,569	"	29	IV. 4					1							1							1																				5			
174	9,643	Ireland	30	III. 53			1									1							1						30 min									1	1				6	Good	Alcoholic; discharged.	
175	9,755	Russia	28	II. 4			1																1						39 "				101	5th "	Few hrs.								6		Fever; constipation.	
													12 hours										1																				8		Midwife called in; discharged.	

N. R. = No record; L. d. = Labor day.

Number.	Confinement Number.	Birthplace.	Age.	Para.	Mortality of Gestation.	Abortions.	Premat. Labors.	Previous	Hospital Case.	Undetected	Stage of Labor First Seen. 1st Stage.	2d Stage.	3d Stage.	Sex.	Male.	Female.	Length.	Weight.	Greatest Circumf. (Inches) of Head.	Greatest Circumf. (Inches) of Thorax.	Before Pres.	Shoulder Pres.	Breech Pres.	Monstrosity.	Placenta. Expressed.	Man. Ext. by Hand.	Duration of Third Stage of Labor.	Hydramnios. Before Delivery.	After Delivery.	Temperature. First Seen.	After Operation.	Highest Temperature.	Day Highest Temperature.	Continued How Long.	Treatment. None.	Uterine Douche.	Finger Curette.	Instrum. Curette.	Gauze Drain.	Epeli.	Complications.	Remarks.	Days of Puerperium.	Discharged. Condition.
																	Ins.	*Lbs.*																											
1	3	Russia	32	V	70																																						6	Good
2	10	Ireland	30	IX	8			8																																				6	"
3	100	Germany	36	V	10																																							6	Poor
4	98	England	31	III	84																																							6	Died.
5	105	"	32	II	7																																							11	"
6	96	Russia	31	VIII	10																																							6	"
7	101	England	31	III	9																																							6	"
8	99	Ireland	34	II	9																																								6	"
9	97	Russia	30	II	8																																								6	"
10	104			II	7																																								6	"
11	95	Holland	34	II	9																																								6	"
12	93	Russia	30	I	7																																								6	"
13	103	Germany	35	II	9																																								6	"
14	102			II	10																																								6	"
15	92	Russia	30	II	9																																								6	"
16	146	Russia	24	I	7																																								6	"
17	89	U. S.		IV	74																																							9	"
18	88	Switzerl'd		IV	90																																							10	"
19	87	Poland		IV	10																																							16	"
20	85	Roumania		V	8																																							16	"
21	84	Russia		V	9																																								16	"
22	82	Austria		VI	8																																								16	"
23	81			VI	8																																								16	"
24	80			VI	8																																								16	"
25	79			VI	8																																								16	"
26	78			VI	8																																								16	"
27	77			VI	8																																								16	"
28	76			VI	8																																								16	"
29	75			VI	8																																								16	"
30	74			VI	8																																								16	"
31	73			VI	8																																								16	"
32	72			VI	8																																								16	"
33	71			VI	8																																								16	"
34	70			VI	8																																								16	"
35	69			VI	8																																								16	"
36	68			VI	8																																								16	"
37	67			VI	8																																								16	"
38	66			VI	8																																								16	"
39	65			VI	8																																								16	"
40	64			VI	8																																								16	"
41	63			VI	8																																								16	"
42	62			VI	8																																								16	"
43	61			VI	8																																								16	"
44	60			VI	8																																								16	"
45	59			VI	8																																								16	"
46	58			VI	8																																								16	"
47	57			VI	8																																								16	"
48	56			VI	8																																								16	"
49	55			VI	8																																								16	"
50	54			VI	8																																								16	"
51	53			VI	8																																								16	"
52	52			VI	8																																								16	"
53	51			VI	8																																								16	"
54	50			VI	8																																								16	"
55	49			VI	8																																								16	"
56	48			VI	8																																								16	"
57	47			VI	8																																								16	"
58	46			VI	8																																								16	"
59	45			VI	8																																								16	"
60	44			VI	8																																								16	"
61	43			VI	8																																								16	"
62	42			VI	8																																								16	"
63	41			VI	8																																								16	"
64	40			VI	8																																								16	"
65	39			VI	8																																								16	"
66	38			VI	8																																								16	"
67	37			VI	8																																								16	"
68	36			VI	8																																								16	"
69	35			VI	8																																								16	"
70	34			VI	8																																								16	"
71	33			VI	8																																								16	"
72	32			VI	8																																								16	"
73	31			VI	8																																								16	"
74	30			VI	8																																								16	"
75	29			VI	8																																								16	"
76	28			VI	8																																								16	"
77	27			VI	8																																								16	"
78	26			VI	8																																								16	"
79	25			VI	8																																								16	"
80	24			VI	8																																								16	"
81	23			VI	8																																								16	"
82	22			VI	8																																								16	"
83	21			VI	8																																								16	"
84	20			VI	8																																								16	"
85	19			VI	8																																								16	"
86	18			VI	8																																								16	"
87	17			VI	8																																								16	"
88	16			VI	8																																								16	"
89	15			VI	8																																								16	"
90	14			VI	8																																								16	"
91	13			VI	8																																								16	"
92	12			VI	8																																								16	"
93	11			VI	8																																								16	"
94	9			VI	8																																								16	"
95	8			VI	8																																								16	"
96	7			VI	8																																								16	"
97	6			VI	8																																								16	"
98	5			VI	8																																								16	"
99	4			VI	8																																								16	"
100	2			VI	8																																								16	"

N. R. = No record; L. d. = Labor day.

Number.	Confinement Number.	Birthplace.	Age.	Parity.	Previous Abortions.	Previous Premature Births.	Delivered by	Stage of Labor Prior to First Seen.	Child. Months of Gestation.	Child. Presentation.	Child. Sex.	Child. Weight.	Child. Length.	Child. Greatest Circumference of Head.	Child. Smallest Circumference of Head.	Child. Fetal Type.	Child. Stillborn.	Child. Macerated.	Child. Living.	Child. Spontaneous.	Child. Expressed.	Child. Removed by Forceps.	Child. Incision Uterus.	Placenta. Separated.	Placenta. Expressed.	Placenta. Removed by Hand.	Placenta. Incision Uterus.	Duration of Third Stage of Labor.	Hemorrhage. Before Delivery.	Hemorrhage. After Delivery.	Temperature. First Rectal.	Temperature. At Operation.	Temperature. After Operation.	Temperature. Highest Temperature.	Temperature. Time Highest Temperature.	Temperature. Continued How Long.	Treatment. None.	Treatment. Vaginal Douche.	Treatment. Uterine Douche.	Treatment. Finger Curette.	Treatment. Instrum. Curette.	Treatment. Ganger Irrig. Drain.	Complications.	Day of Puerperium.	Discharged. Condition.	Remarks.
												Lbs.	In.																														
100	5,737	Russia	37	12		12																						25 min.												Caked breasts.	7	Good	Measurements not taken.
101	5,737	"	35		12																							1hr.5m.													8	"	Child discharged living.
102	5,738	"	36		11																							25 min.													9	"	
103	6,043	Denmark	35		17	11																																		1 day . .	6	"	) Twins; no measurements; one placenta, two sacs
																																							2 days .	7	"	) one out of bed 6th day.
104	5,808	U. S.	35	VII.	0	1																																		20 days .	8	"	) Twins; breech extr.; one placenta; two sacs; two
105	5,810	Russia	32	V.	0	4																																		15 days .	9	"	) cords; one chorion. [charged not known.
106	5,806	"	27	V.	0	3																																				8	"	Child discharged living; low forceps; cond. when dis.
107	5,807	"	30	IV.	0	2																																				8	Bad.	Child discharged living; patient sent to Glow. Hosp.
108	5,947	"	30	III.	2	0																																				9	Good	Child discharged living.
109	5,956	Germany	30	IV.	0	2																																				8	Bad.	Sent to Bellevue Hospital third day.
110	6,128	Russia	30	II.	0	1																																				11	Good	
111	6,130	Germany	30	III.	0	1																																				8	"	
112	6,148	Russia	23	I.	0	1																																				10	"	Single rise 101° seventh day; caked breasts.
113	6,149	"	28	XVI.	7	6																																				16	"	
114	6,204	"	28	XV.	6	6																																				15	"	
115	6,205	"	30	IV.	0	3																																				8	"	Child discharged living.
116	6,324	"	30	VIII.	7	0																																				15	"	Fallopian caries; manual extrac. mem.
117	6,325	"	32	II.	1	0																																				10	"	Only one temp. rise (1st day); caked breasts on 4th day
118	6,423	"	30	III.	2	1																																				10	"	
119	6,426	"	30	II.	1	0																																				10	"	Up; lochia slight; serous.
120	6,427	U. S.	30																																						8	"	
121	6,428	U. S.	30																																						8	"	
122	6,545	Roumania	30	II.	0	1																																				8	"	[first child
123	6,546	U. S.	30	V.	0	3																																			Twins; both children discharged living; forceps to
124	6,547	Russia	24	III.	0	2																																			8	"	Child discharged living.
125	6,574	"	30	II.	1	0																																			8	"	
126	6,575	"	28	I.	0	1																																				8	"	
127	6,576	"	30	II.	0	1																																				8	"	
128	6,577	"	30	II.	0	1																																				8	"	
129	6,578	"	30	II.	0	1																																				8	"	
130	6,579	"	30	II.	0	1																																				8	"	
131	6,580	"	30	II.	0	1																																				8	"	
132	6,581	"	30	II.	0	1																																				8	"	
133	6,582	"	30	II.	0	1																																				8	"	
134	6,583	"	30	II.	0	1																																				8	"	
135	6,584	"	30	II.	0	1																																				8	"	
136	6,585	"	30	II.	0	1																																				8	"	
137	6,586	"	30	II.	0	1																																				8	"	
138	6,587	"	30	II.	0	1																																				8	"	
139	6,588	"	30	II.	0	1																																				8	"	
140	6,589	"	30	II.	0	1																																				8	"	
141	6,590	"	30	II.	0	1																																				8	"	
142	6,591	"	30	II.	0	1																																				8	"	
143	6,592	"	30	II.	0	1																																				8	"	
144	6,593	"	30	II.	0	1																																				8	"	
145	6,594	"	30	II.	0	1																																				8	"	
146	6,595	"	30	II.	0	1																																				8	"	
147	6,596	"	30	II.	0	1																																				8	"	
148	6,597	"	30	II.	0	1																																				8	"	
149	6,598	"	30	II.	0	1																																				8	"	
150	6,599	"	30	II.	0	1																																				8	"	
151	6,600	"	30	II.	0	1																																				8	"	
152	6,601	"	30	II.	0	1																																				8	"	
153	6,602	"	30	II.	0	1																																				8	"	
154	6,603	"	30	II.	0	1																																				8	"	
155	6,604	"	30	II.	0	1																																				8	"	
156	6,605	"	30	II.	0	1																																				8	"	
157	6,606	"	30	II.	0	1																																				8	"	
158	6,607	"	30	II.	0	1																																				8	"	
159	6,608	"	30	II.	0	1																																				8	"	
160	6,609	"	30	II.	0	1																																				8	"	
161	6,610	"	30	II.	0	1																																				8	"	
162	6,611	"	30	II.	0	1																																				8	"	
163	6,612	"	30	II.	0	1																																				8	"	
164	6,613	"	30	II.	0	1																																				8	"	
165	6,614	"	30	II.	0	1																																				8	"	
166	6,615	"	30	II.	0	1																																				8	"	
167	6,616	"	30	II.	0	1																																				8	"	
168	6,617	"	30	II.	0	1																																				8	"	
169	6,618	"	30	II.	0	1																																				8	"	
170	6,619	"	30	II.	0	1																																				8	"	
171	6,620	"	30	II.	0	1																																				8	"	
172	6,621	"	30	II.	0	1																																				8	"	
173	6,622	"	30	II.	0	1																																				8	"	
174	6,623	"	30	II.	0	1																																				8	"	
175	6,624	"	30	II.	0	1																																				8	"	
176	6,625	"	30	II.	0	1																																				8	"	
177	6,626	"	30	II.	0	1																																				8	"	
178	6,627	"	30	II.	0	1																																				8	"	
179	6,628	"	30	II.	0	1																																				8	"	
180	6,629	"	30	II.	0	1																																				8	"	
181	6,630	"	30	II.	0	1																																				8	"	
182	6,631	"	30	II.	0	1																																				8	"	
183	6,632	"	30	II.	0	1																																				8	"	
184	6,633	"	30	II.	0	1																																				8	"	
185	6,634	"	30	II.	0	1																																				8	"	
186	6,635	"	30	II.	0	1																																				8	"	
187	6,636	"	30	II.	0	1																																				8	"	
188	6,637	"	30	II.	0	1																																				8	"	
189	6,638	"	30	II.	0	1																																				8	"	
190	6,639	"	30	II.	0	1																																				8	"	
191	6,640	"	30	II.	0	1																																				8	"	
192	6,641	"	30	II.	0	1																																				8	"	
193	6,642	"	30	II.	0	1																																				8	"	
194	6,643	"	30	II.	0	1																																				8	"	
195	6,644	"	30	II.	0	1																																				8	"	
196	6,645	"	30	II.	0	1																																				8	"	
197	6,646	"	30	II.	0	1																																				8	"	
198	6,647	"	30	II.	0	1																																				8	"	
199	6,648	"	30	II.	0	1																																				8	"	
200	6,649	"	30	II.	0	1																																				8	"	
201	6,650	"	30	II.	0	1																																				8	"	
202	6,651	"	30	II.	0	1																																				8	"	
203	6,652	"	30	II.	0	1																																				8	"	
204	6,653	"	30	II.	0	1																																				8	"	
205	6,654	"	30	II.	0	1																																				8	"	
206	6,655	"	30	II.	0	1																																				8	"	
207	6,656	"	30	II.	0	1																																				8	"	
208	6,657	"	30	II.	0	1																																				8	"	
209	6,658	"	30	II.	0	1																																				8	"	
210	6,659	"	30	II.	0	1																																				8	"	
211	6,660	"	30	II.	0	1																																				8	"	
212	6,661	"	30	II.	0	1																																				8	"	
213	6,662	"	30	II.	0	1																																				8	"	
214	6,663	"	30	II.	0	1																																				8	"	
215	6,664	"	30	II.	0	1																																				8	"	
216	6,665	"	30	II.	0	1																																				8	"	
217	6,666	"	30	II.	0	1																																				8	"	
218	6,667	"	30	II.	0	1																																				8	"	
219	6,668	"	30	II.	0	1																																				8	"	
220	6,669	"	30	II.	0	1																																				8	"	
221	6,670	"	30	II.	0	1																																				8	"	
222	6,671	"	30	II.	0	1																																				8	"	
223	6,672	"	30	II.	0	1																																				8	"	
224	6,673	"	30	II.	0	1																																				8	"	
225	6,674	"	30	II.	0	1																																				8	"	
226	6,675	"	30	II.	0	1																																				8	"	
227	6,676	"	30	II.	0	1																																				8	"	
228	6,677	"	30	II.	0	1																																				8	"	
229	6,678	"	30	II.	0	1																																				8	"	
230	6,679	"	30	II.	0	1																																				8	"	
231	6,680	"	30	II.	0	1																																				8	"	
232	6,681	"	30	II.	0	1																																				8	"	
233	6,682	"	30	II.	0	1																																				8	"	
234	6,683	"	30	II.	0	1																																				8	"	
235	6,684	"	30	II.	0	1																																				8	"	
236	6,685	"	30	II.	0	1																																				8	"	
237	6,686	"	30	II.	0	1																																				8	"	
238	6,687	"	30	II.	0	1																																				8	"	
239	6,688	"	30	II.	0	1																																				8	"	
240	6,689	"	30	II.	0	1																																				8	"	
241	6,690	"	30	II.	0	1																																				8	"	
242	6,691	"	30	II.	0	1																																				8	"	
243	6,692	"	30	II.	0	1																																				8	"	
244	6,693	"	30	II.	0	1																																				8	"	
245	6,694	"	30	II.	0	1																																				8	"	
246	6,695	"	30	II.	0	1																																				8	"	
247	6,696	"	30	II.	0	1																																				8	"	
248	6,697	"	30	II.	0	1																																				8	"	
249	6,698	"	30	II.	0	1																																				8	"	
250	6,699	"	30	II.	0	1																																				8	"	
251	6,700	"	30	II.	0	1																																				8	"	
252	6,701	"	30	II.	0	1																																				8	"	
253	6,702	"	30	II.	0	1																																				8	"	
254	6,703	"	30	II.	0	1																																				8	"	
255	6,704	"	30	II.	0	1																																				8	"	
256	6,705	"	30	II.	0	1																																				8	"	
257	6,706	"	30	II.	0	1																																				8	"	
258	6,707	"	30	II.	0	1																																				8	"	
259	6,708	"	30	II.	0	1																																				8	"	
260	6,709	"	30	II.	0	1																																				8	"	
261	6,710	"	30	II.	0	1																																				8	"	
262	6,711	"	30	II.	0	1																																				8	"	
263	6,712	"	30	II.	0	1																																				8	"	
264	6,713	"	30	II.	0	1																																				8	"	
265	6,714	"	30	II.	0	1																																				8	"	
266	6,715	"	30	II.	0	1																																				8	"	
267	6,716	"	30	II.	0	1																																				8	"	
268	6,717	"	30	II.	0	1																																				8	"	
269	6,718	"	30	II.	0	1																																				8	"	
270	6,719	"	30	II.	0	1																																				8	"	
271	6,720	"	30	II.	0	1																																				8	"	
272	6,721	"	30	II.	0	1																																				8	"	
273	6,722	U. S.	30																																						8	"	
274	6,723	Russia	30	IV.	0	1																																				8	"	
275	6,724	"	30	III.	0	1																																				8	"	
276	6,725	"	30	II.	0	1																																				8	"	
277	6,726	"	30	II.	0	1																																				8	"	
278	6,727	"	30	II.	0	1																																				8	"	
279	6,728	"	30	II.	0	1																																				8	"	
280	6,729	"	30	II.	0	1																																				8	"	
281	6,730	"	30	II.	0	1																																				8	"	
282	6,731	"	30	II.	0	1																																				8	"	
283	6,732	"	30	II.	0	1																																				8	"	
284	6,733	"	30	II.	0	1																																				8	"	
285	6,734	"	30	II.	0	1																																				8	"	
286	6,735	"	30	II.	0	1																																				8	"	
287	6,736	"	30	II.	0	1																																				8	"	
288	6,737	"	30	II.	0	1																																				8	"	
289	6,738	"	30	II.	0	1																																				8	"	
290	6,739	"	30	II.	0	1																																				8	"	
291	6,740	"	30	II.	0	1																																				8	"	
292	6,741	"	30	II.	0	1																																				8	"	
293	6,742	U. S.	30																																						8	"	
294	6,743	"	30																																						8	"	
295	6,744	"	30																																						8	"	
296	6,745	"	30																																						8	"	
297	6,746	"	30																																						8	"	
298	6,747	"	30																																						8	"	
299	6,748	"	30																																						8	"	
300	6,749	"	30																																						8	"	
301	6,750	"	30																																						8	"	
302	6,751	"	30																																						8	"	
303	6,752	"	30																																						8	"	
304	6,753	"	30																																						8	"	
305	6,754	"	30																																						8	"	
306	6,755	"	30																																						8	"	
307	6,756	"	30																																						8	"	
308	6,757	"	30																																						8	"	
309	6,758	"	30																																						8	"	
310	6,759	"	30																																						8	"	
311	6,760	"	30																																						8	"	
312	6,761	"	30																									

Relative Frequency.

For many reasons exact figures as to the relative frequency of prematurely interrupted pregnancies are difficult to obtain. During the first eight weeks undoubtedly many interruptions of pregnancy pass unnoticed, and later in pregnancies very few enter maternities, and many even do not come under the notice of private physicians or polyclinic hospital services.

In favor of a greater accuracy of our statistics is the fact that all of the 635 cases of untimely interruptions of pregnancy were outdoor or polyclinic cases, and patients under such circumstances—in their own homes—are more likely to seek aid under their own roof than apply for admission to a general or maternity hospital. Therefore, while it is impossible, with the material at our command, or, in fact, with any material, to indicate in a precise way the frequency of interrupted pregnancy, and at what period this accident is most prone to occur, still, for reasons already given, we believe in a general way our statistics and findings are valuable and interesting.

Among the 10,000 cases of labor studied in this Report, we find 635 premature interruptions of pregnancy; namely, 417 abortions and 218 premature labors. This gives us a relative frequency of:

One abortion to every 24 labors.

One premature labor to every 45.8 labors.

One premature interruption of pregnancy to every 15.7 labors.

The 635 cases of the premature interruption of pregnancy studied in this article may be divided and classified according to the nativity of the patients, as in the following table:

Table of Nativity.

Nativity.	Early Abortions.	Late Abortions.	Premature Labors.	Total Interrupted Pregnancies.	Full Term Labors.	Total Interrupted and Full Term.	Percentage of Interrupted Pregnancies.
United States..	23	19	27	69	819	888	7.77%
Germany.....	14	5	15	34	378	412	8.25%
Russia	160	117	128	405	6,282	6,687	6.08%
Poland.....	5	3	4	12	244	256	4.70%
Ireland	11	4	7	22	311	333	6.63%
England	4	2	3	9	112	121	7.43%
Austria	10	5	7	22	707	729	3.01%
Roumania	2	6	8	16	118	134	11.94%
Hungary.....	3	1	2	6	168	174	3.44%
Scotland	.....	.....	.....	.....	10	10	
Holland.....	.....	.....	1	1	3	4	25.00%
Switzerland ...	.....	.....	3	3	6	9	33.00%

Table of Nativity.—(Continued.)

Nativity.	Early Abortions.	Late Abortions.	Premature Labors.	Total Interrupted Pregnancies.	Full Term Labors.	Total Interrupted and Full Term.	Percentage of Interrupted Pregnancies.
Sweden					5	5	
Canada					4	4	
France					3	3	
Wales					1	1	
Turkey					2	2	
Italy	1	1	1	3	20	23	13.04%
Egypt					1	1	
Arabia					1	1	
Bermuda					1	1	
Australia					1	1	
Unknown	9	12	12	33	166	199	16.58%
Total	242	175	218	635	9,365	10,000	

Again, the 635 cases of the untimely interruption of pregnancy analyzed in this article may be divided and classified according to the age of the women, as in the accompanying table. For purposes of comparison here, as in the Table of Nativity, we have added the numbers of the full-term labors occurring in the service of the Hospital during the same period.

Table of Age of Patients.

	Early Abortions.	Late Abortions.	Premature Labors.	Total Interrupted Pregnancies.	Full Term.	Total Interrupted and Full Term.	Percentage of Interrupted Pregnancies.
19 and under	8	7	17	32	905	937	3.42%
20–24	54	42	86	182	3,455	3,627	5.01%
25–29	72	52	57	181	2,821	3,002	6.02%
30–34	47	32	26	105	1,328	1,433	7.33%
35–39	34	25	23	82	670	782	10.48%
40–44	11	4	3	18	77	95	18.94%
45–49					11	11	
50–54					1	1	
Unknown	16	13	6	35	97	112	31.25%
Total	242	175	218	635	9,365	10,000	

In the foregoing table we have, in addition, worked out the percentages of the frequency of interrupted pregnancy in the different five-year groups of ages.

Our table shows a progressive increase in the percentages of the frequency of the untimely interruption of pregnancy from the group aged nineteen years and under, until the maximum is reached between the fortieth and forty-fourth years. It will be noticed that there is little variation in the percentages of interruption from the twentieth to the thirtieth year, that there is a marked increase for the period between the thirty-fifth and thirty-ninth year, and a still more marked increase for the period between the fortieth and forty-fourth year, which latter period gives us the maximum of interruption for our cases.

From our studies we may safely draw the conclusion that the least probability of an untimely interruption of pregnancy is before the twenty-fifth year, and that the greatest probability is after the fortieth year.

In the following table we have arranged the relative frequency of interrupted pregnancy according to the number of preceding labors (— para), and in this table, too, for purposes of comparison, we have added the number of mature labors.

TABLE OF PARA.

Para.	Early Abortions.	Late Abortions.	Premature Labors.	Total Interrupted Pregnancies.	Full Term.	Total Interrupted and Full Term.
I	29	22	71	122	2,009	2,131
II	31	24	31	86	1,784	1,870
III	32	26	29	87	1,438	1,525
IV	29	29	19	77	1,120	1,197
V	28	15	18	61	860	921
VI	16	12	11	39	661	700
VII	18	9	11	38	485	523
VIII	15	15	8	38	343	381
IX	8	6	4	18	227	245
X	10	3	5	18	148	166
XI	4	3	1	8	66	74
XII	2	.....	1	3	65	68
XIII	.....	1	4	5	33	38
XIV	3	.....	.....	3	13	16
XV	1	.....	.....	1	7	8
XVI	1	.....	1	2	.....	.....
XVII	.....	.....	.....	.....	1	1
XVIII	.....	.....	.....	.....	.....	.....
XIX	.....	.....	.....	.....	.....	.....
XX	1	.....	.....	1	.....	1
Unknown	14	10	4	28	105	135
Total	242	175	218	635	9,365	10,000

If, for purposes of convenience, we condense the preceding table of para, and recognize three groups only, according to the number of preceding labors, namely, primiparæ, pluriparæ* and multiparæ (*i.e.*, more than V. paræ), and construct a table on this basis, we will have the following:

TABLE OF PARA.—(*Condensed.*)

Para.	Early Abortions.	Late Abortions.	Premature Labors.	Total Interrupted Pregnancies.	Total Full Term.	Total Interrupted and Full Term.
Primiparæ	29	22	71	122	2,009	2,131
Pluriparæ*	120	94	97	311	5,202	5,513
Multiparæ	79	49	46	174	2,047	2,221
Unknown	14	10	4	28	107	135
Total	242	175	218	635	9,365	10,000

Our foregoing table shows that in primigravidæ gestation is least endangered in the first months of pregnancy; for among 122 untimely interruptions in primigravidæ we find 29 early abortions, 22 late abortions, and 71 premature labors. Thus we see again from the above that the frequency of interruption increased with the further advance of pregnancy.

A glance at our table will show that in pluriparæ and multiparæ the relation is reversed: the majority of interruptions among these occurring in the first months of pregnancy, and that the frequency of interruption now decreases with the further advance of gestation.

The greater frequency of uterine disease in multiparæ, and the large number of preceding labors, some of them, at least, undoubtedly anomalous, is a sufficient explanation of the greater frequency of abortion than of premature labor in multiparæ.

The study of our material also allows us to confirm the observations of Winckel,[2] Stumpf,[3] and others, that with every additional interruption of pregnancy the time of gestation recedes, so that after the occurrence of a premature labor there ensue, first, late abortions, and finally early abortions. The uterus, therefore, in the presence of uterine disease, becomes ever less tolerant of subsequent pregnancies, and expels its contents earlier, in proportion to the number of preceding interruptions of pregnancy. As Winckel and Stumpf put it: "The longer existence of uterine disease leads to ever earlier interruption of pregnancy."

In the following table we indicate the frequency of the untimely interruption of pregnancy in the different months of gestation:

* Pluriparæ = II., III., IV., V. paræ.

Month of Gestation.

Week.	Month.	Number of Cases.	Percentage of Interruption.	
4	I.			
6	1½			10 Not Noted.
8	II.	61	9.61%	
10	2½	40	6.29%	232 Early Abortions.
12	III.	131	20.63%	
14	3½	21	3.31%	
16	IV.	62	9.76%	
18	4½	9	1.42%	
20	V.	35	5.51%	175 Late Abortions.
22	5½	9	1.42%	
24	VI.	28	4.42%	
26	6½	11	1.73%	
28	VII.	47	7.40%	
30	7½	14	2.20%	
32	VIII.	65	10.26%	
34	8½	15	2.37%	218 Premature Labors.
36	IX.	50	7.99%	
38	9½	27	4.26%	
			Total...	635 Interrupted Pregnancies.

In the foregoing table the month of gestation is not noted in ten cases only (early abortions).

Our material and the above table accentuate the well-known liability to the occurrence of interruptions at the third month (23.91 per cent.).

Further, it is of interest to note the slight liability at the sixth month (6.15 per cent.); and also, but with a slight increase, at the seventh month (9.6 per cent.); while it will be noted that in the eighth and ninth months the frequency again rises (12.63 per cent. and 12.25 per cent. respectively).

Pathology.

The pathology of interrupted pregnancy, like the bacteriology, differs little or not at all from the disease processes taking place at full term. The same degenerations (syphilitic, hydatidiform, fatty, sarcoid) and the same infections (septicæmic, pyæmic, sapræmic, and tuberculous) are found. It is difficult to assign any relative value to these morbid conditions in this connection, but in view of the greater frequency of sepsis in childbed we shall consider that portion of the subject first.

The identity of septic infections in all parts of the body, though presenting the most varied clinical pictures, has been firmly established by the demonstration of the part played in them etiologically by pathogenic micro-organisms. The changing degree in these processes, nowhere more marked than in the puerperium, patent to all observers, is explained by the theory of a variation in virulence of the microbes. It is not necessary to review the classifications adopted by various authors before the advent of bacteriological science; we merely refer to the papers of Chailly,[4] Maunsell,[5] and Churchill[6] as examples of the work done in this line during the earlier part of the present century. The best work of the bacteriologists is of very recent date. Haushalter,[7] in 1890, declared that the streptococcus pyogenes is the active factor in all forms of puerperal sepsis; according to his investigations, it is present in acute septicæmia without suppuration, in pseudo-membranous septicæmia, in pyohæmic septicæmia, and in erysipelas. De Marbaix,[8] three years later, proved the above-mentioned changes in virulent power of this same microbe. He believes that virulence is lessened by age and by the failure of growth of new generations; that it is increased by inoculation into rabbits; and, in support of his theory, produced erysipelas in mice from harmless streptococci of the buccal cavity and showed the change to innocuousness of the germ taken from an endocarditis. Widal[9] classifies septic infections as diphtheritic, purulent, and septicæmic—all due to invasion by the streptococcus. Bumm's[10] classification is, however, the one most generally accepted, and arranged in increasing order of virulence is as follows: Localized septic metritis, thrombotic form of puerperal fever, ordinary lymphatic form, and internal erysipelatous form. Gärtner's[11] work is considered unsatisfactory by bacteriologists for the reason that he claims that culture methods are unreliable, and pins his faith to stained sections alone for differentiation. He attempts no classification.

Septic infection may have its starting-point in any solution of continuity of the mucous surfaces of the birth canal. Consequently, many infections of a lighter character begin in injuries of the cervix and perineum. Fritsch,[12] among others, has particularly emphasized the former avenue as the route of invasion, and the thickenings in the cervical region in multiparæ are too familiar to gynæcologists to need even a mention. Pelvic abscess, thickening of the round and sacral ligaments, and inflammatory changes in them are sequelæ of cervical infection.

Bumm[10] and Gärtner[11] have made clear the mode of invasion of the organisms at the placental site; the classification of Bumm is the result of study of his microscopic preparations. According to him, septic endometritis shows a superficial layer of necrotic tissue pervaded by pyogenic and putrefactive germs. A zone of reaction, of protection, consisting of leucocytes, lies just below this, including the remains of the membranes and part of the muscular coat, but containing no bacteria. The thrombotic form is only a greater development, together with a general systemic infection through the venous radicles. Putrid endometritis and the reaction zone are present, but there is, in addition, a purulent phlebitis and thrombosis at the placental site. The thrombi undergo purulent degeneration,

and portions of them are carried in the blood stream over the body. In the lymphatic variety, infection takes place through these channels and results in a general systemic invasion. The deciduæ are necrotic and present the appearance called croupous. The organisms pass from the endometrium into the open lymphatics, which undergo degeneration and form pus cavities. The last two forms may, of course, occur together. The internal erysipelatous variety shows microscopically necrotic decidua in the uterus and an exudate or false membrane in the vagina. Microscopically, there is an ill-defined reaction zone, the cocci have invaded the uterine muscle and the smaller lymphatics. There is usually a septic peritonitis from extension. We do not understand how this is to be separated in any way from the lymphatic form, nor do we see the necessity for the division. Gärtner,[11] by his researches, has confirmed Bumm's statements as to his thrombotic and lymphatic forms of septic invasion. He finds no histological difference between pyæmia and septicæmia, a result not unexpected nor unsupported, and thinks the chemist must make the diagnosis between the two.

We have examined microscopically the scrapings of the uterus in seven of our cases, and present the results for what they are worth. (Compare Synopsis Tables.)

Case 6,897.—Well-formed placenta showing amnion, chorion with distinct villi covered with epithelium, decidua with characteristic large cells. *Normal.*

Case 6,900.—About three months. Villi extremely long and slender, cells distinct, vessels distended with blood. *Normal.*

Cases 7,211, 7,133, and 7,083.—Normal, well-formed placenta, showing amnion, chorion, and decidua with its spongy and compact layers well defined. *Normal.*

Case 7,011.—Chorionic villi, long and slightly vascular; decidua cells distinct. Less than three months. *Normal.*

Case 6,844.—Two specimens. *a.* Amnion and chorion normal. Spongy layer of decidua shows necrotic areas around which is marked infiltration of "round cells." Several small vessels contain thrombi. *b.* Scrapings from uterus show decidua only. Uterine glands present of about usual size. Large cells of decidua normal, and many are multinucleated. Two areas of necrosis larger than in specimen *a.* Thrombosis also found in small vessels. Clearly, a case falling in the thrombotic class in Bumm's classification.

Attention is drawn to a point in treatment suggested by these pathological findings, which will be considered at greater length farther on; viz., the necessity for non-interference, surgically speaking, with a septic uterus. It is never possible to decide macroscopically to what extent microbic invasion of the muscular wall has taken place; and curettage, in its softened condition, is more than likely, instead of removing the offending material, to cause a general infection by loss of the protective zone of reaction, and the opening of venous and lymphatic channels to the cocci present. This point is emphasized by Williams[13] and others.

Genital tuberculosis may be either a primary or a secondary infection. In the first case, it takes place often through the vagina, usually by coitus; in the second, it derives its origin from a focus of disease in the body. In either case the tubes are most often first attacked, especially during the period of menstruation (Sippell[14]). It is the uterus, however, with which we are chiefly concerned here. Williams[15] and Cullen,[16] of the Johns Hopkins Hospital, have investigated the subject thoroughly. Their papers contain a practically complete bibliography, with reports of their own cases, and their conclusions may be accepted as representing the fullest state of our present knowledge. Chronic diffuse tuberculosis begins usually at the top of the fundus. In the earlier stages it cannot be made out macroscopically, and may be beyond the reach of the curette, hidden in the cornua. Later the nodules appear beneath the surface and finally ulcerate. The endometrium is transformed into caseous material, and if the cervix is occluded, the cavity may fill with detritus, simulating pyometra. After a time the tuberculosis includes the muscular wall. Histologically, in the beginning, the epithelium is intact or proliferated into papillary projections, the tubercles lying in the stroma; later, the glands are affected, tubercles appear in their walls, they are obliterated, and their place is taken by tuberculous material. The line of juncture between sound and diseased tissue is sharply defined by a layer of round-cell infiltration. Extension usually takes place from the tubes to the uterus, and the process in them is more advanced than in the latter organ. It may, however, be infected primarily and directly from without. Although no case of premature delivery has, to our knowledge, been reported as due to uterine tuberculosis, it is not difficult, in view of the picture just given of the degeneration in endometrium and muscle, to conceive how such a condition may become possible.

Lehmann[28] reported to the Berlin Medical Society two cases of placental tuberculosis, one of the maternal portion in a phthisical woman, the other of the fœtal part. The changes were very slight in the placenta, but they point out an avenue of entrance for bacilli into the infant body. Hirschfeld[29] and Schmorl[29] found tubercle bacilli in the fœtal liver, the mother being phthisical.

Perhaps the most important point connected with the pathology of abortion is the belief which has been in the past few years slowly gaining ground, that even in instances of so-called complete abortion, with unruptured ovum, some shreds of decidua always remain behind, a theory which is strengthened by the fact that these cases, treated expectantly, always have a more or less offensive lochia, and that involution is always retarded (Dührssen[17]).

As we have already pointed out, the term *abortion*, in its narrowest sense, is confined to the spontaneous emptying of the uterus in the first twelve weeks of gestation; namely, to the period when the decidua reflexa and vera have not been united, and when active treatment has for its object not only the removal of the ovum with the decidua reflexa and placental attachment, but also of the decidua vera. Until recently, the accepted idea

has been that the ovum separates from below upward (Schroeder,[18] Spiegelberg[19]), but the studies of Dührssen[17] and others (Dohrn—personal letter to Dührssen) appear to prove that this mechanism is not the usual one, at least. On the commencement of uterine contractions, separation begins at the placental site, followed by the remainder of the decidua vera from above, downward. Careful investigation of cases bears out this statement.

Cases of inevitable abortion, with an unruptured ovum, which permit of the passage of the finger through the os, reveal one of the two following conditions: 1. Passing between the ovum and uterine wall, the finger finds a more or less firm attachment at the fundus. If this is broken up, the ovum, consisting of decidua reflexa and the rudimentary placenta, is removed, leaving the decidua vera, entire or in part, behind. Its smooth surface, lining the uterus except at the fundus, where many fine shreds are found, is easily felt by the finger. Removal by curettage proves this retention beyond doubt. If separation took place from below, upward, the finger would pass between uterine wall and decidua to the placental site, and the ovum be removed intact. This does occur in exceptional cases, but as a rule the finger feels two smooth apposite surfaces, that of the reflexa over the ovum and that of the vera on the uterus. This is due to the fact that until the end of the third month the firm attachment of the vera guides the finger within its cavity, between it and the reflexa. 2. The ovum in this case is found in the dilated cervix, attached to the uterine wall by a pedicle composed of the vera. The vera was detached from above, downward, and is still fastened to the lower segment of the organ. Attempts at expression or detachment result in tearing this pedicle, and part of the decidua vera remains behind. If separation occurred, as formerly thought, from below, up, the pedicle would extend to the placental site, at which point alone the ovum would be held. This finally giving way, the uterine contents would be expelled entire, we should have a complete abortion, and the curette would not be needed. It is because the first is the more frequent occurrence that retention of the decidua happens after spontaneous abortion or abortion after the use of tampons, and hæmorrhage and sepsis are produced. (As Dührssen[17] and others have pointed out, it is quite possible that varieties of placental attachment may influence the mode of separation and expulsion.)

Moreover, the decidua vera may be expelled even before the ovum, when it becomes detached from the uterine walls by blood extravasation. Again, in old cases of neglected incomplete abortion, the curette secures nothing but a portion of rudimentary placenta, because the vera has been washed away after breaking down, as in labor at term.

Macroscopical examination cannot always determine that the ovum is intact. Exploration of the uterus alone gives a positive diagnosis. Dührssen[17] curetted after twelve cases of apparently complete abortion, and the microscope demonstrated that more or less decidua was retained.

Winckel[26] believes that the entire ovum, intact with the vera, may pass out in the first months. When separation does take place, it is, in his opinion, at the decidua serotina, leaving the ovum behind. Again, the

reflexa may be torn in the ovum's descent, leaving it with the vera and serotina to pass away during the puerperium, or to be removed by curettage. It is possible for the chorion to be ruptured as well, the cord being torn from the placenta; and the embryo, enclosed in amnion, alone expelled. The mechanism last mentioned is the rarest, but may occur even at the sixteenth or twentieth week. A modification of it is shown when decidua vera, reflexa, and chorion are torn away, leaving the placenta, fitted like a cap, on the amnion.

The question of the propriety of interference must rest upon clinical results, however, and not upon theoretical deductions. Clinical experience shows us that the mechanism of placental and decidual separation varies according to the period of gestation. Klein[21] has recently studied the process of involution of the decidua after abortion and labor at term. He reached the conclusion that, after abortion, the vera remains wholly or in part in the uterus. The decidual cells and superficial epithelium perish *in loco* by necrosis. The necrotic mass is absorbed or expelled, and the epithelium regenerated from below. The process is terminated in four to six weeks. At term, a fatty degeneration, a coagulation necrosis, occurs in the cells of the decidua, which forms a line of demarcation between the deep layer of the vera remaining in the uterus and the upper destructible layer forming a physiological separation zone, so that at labor there passes out with the ovum the greater part of the uterine surface which has become decidua. The membranes and placenta are completely expelled, except when they are more intimately attached to the wall, as by inflammatory change in chronic endometritis. This physiological change of fatty necrosis, the anatomical condition resulting from it, and the method of separation at term, vary widely from that found in abortion explained above, and constitute the great argument in favor of an active treatment in abortion during the period before the sixteenth week.

The sequelæ of incomplete abortion furnish further proof of the necessity of operative interference. Ekstein[22] believes endometritis post abortum to be of common occurrence; and in two cases in which curettage alone brought the hæmorrhage to a standstill, the microscope revealed in the shreds glandular hypertrophic endometritis. Kürstner[23] has brought positive proof to show that an endometritis may depend on incomplete abortion, for in a polypus removed from a uterus he found placental cotyledons. Fritsch[24] is convinced that endometritis is especially liable to follow abortions. The decidua, being already hypertrophic and unable to involute, undergoes further thickening and remains subject to hæmorrhage. Aside from this, interstitial inflammation and other inflammatory conditions arise, resulting in involvement of the glands and presenile atrophy. Schroeder[25] speaks of the inflammatory interstitial areas, and states that they must be differentiated from so-called endometritis post abortum in which the hæmorrhage results by reason of retained secundines merely. On the other hand, Winckel,[26] following out his claim that abortion may be complete, holds that the chronic endometritis is due to puerperal causes, an upward extension of a cervical catarrh. Porak,[27] from a study of 326

cases of abortion and immature labor, although recognizing thickening and adhesion of the decidua to be the most frequent cause of the accident, denies that the condition demands curettage, reserving the latter for hæmorrhage and endometritis, holding at the same time that the membranes are spontaneously eliminated.

We have now reached the last division in the subject of pathology, namely, the degenerations of placenta and decidua concerned in the production of abortion or occurring as a sequela of the accident. Of these, the syphilitic is, of course, much the most important, not only in view of its frequency, but as regards the infant mortality, even in cases when the labor is at term. According to Councilman,[30] little advance has been made in this line since the publication of Frankel's classical work. Briefly summed up, the conclusions are these: (*a*) There is a syphilitic disease of the placenta, found only with congenital disease of the fœtus, characterized by hyperplasia of the epithelial and stroma cells of the villi, producing compression, sometimes complete obliteration of the vessels. The proliferated cells finally undergo fatty degeneration. The vessels themselves show few changes, and these chiefly of an atheromatous nature (Oedmansson). There are slighter, focal changes in the placenta in syphilis, which are probably of much less importance to the fœtus. Macroscopically, the lesions consist of a hypertrophy of the entire organ or some of its cotyledons. (*b*) When the disease is conveyed by the father, the mother being healthy, the fœtus and placenta are affected. When the mother is attacked with the embryo in conception, the placenta is generally diseased in both fœtal and maternal portions. If the woman becomes syphilitic later, the placenta may be sound or diseased; in the latter case, its affection is gummatous syphilis. In infection after the seventh month there is usually no specific change in fœtus or placenta. It is often difficult to decide whether intrauterine death and abortion are due to this disease of the placenta alone, since the lesions in the child are often far more advanced, although its injurious effect on fœtal vitality must remain unquestioned.

Among the important causes of intrauterine death are faulty conditions of the fœtal envelopes and appendages. These conditions, on the maternal side, according to Priestly,[32] are imperfect or excessive development of the decidua or extravasation of blood between reflexa and chorion, causing the so-called apoplexy of the ovum. Inflammation of the decidua, decidual endometritis of whatever form, is a prime factor (Virchow) in the causation of chorionic disease, the villi being unable to take root in its indurated and thickened substance. The death of the fœtus is the natural sequence of chorionic changes which are chiefly cystic, resulting in the condition known as hydatidiform mole. Virchow's view, that the true nature of this degeneration is myxomatous, is, as will be seen, at least probably correct. Hehrer[31] has tabulated fifty cases of this affection, showing clearly its relation to our subject. Abortion occurred at the fourth month in fifteen cases, at the fifth in thirteen; two only were delivered at term, and two aborted in the second month. In more than half the patients, flooding

occurred. In thirty-four cases expectant treatment resulted satisfactorily, but among the rest were cases of debility, fever, etc., a clear indication for prophylactic curettage, although no deaths resulted. Sterility was by no means the rule in these cases after molar pregnancy.

Hydatidiform degeneration of the placenta has acquired in late years a new interest, aside from its rôle in the etiology of abortion. This is found in its frequent occurrence, not to put the case too strongly, preceding the condition appropriately termed "deciduoma malignum." Of twenty-six undoubted cases collected by Williams,[33] eleven have followed hydatidiform moles. "When we consider the marked infrequency of hydatidiform moles in general, and the very large proportion of the cases of deciduomata which have been preceded by them, it is not difficult to believe that they stand in some sort of causal relation." Williams thinks that too much stress should not be laid on this, since there is no structural difference between deciduomata following moles and ordinary pregnancies. Pregnancy itself seems to be a condition *sine qua non* for the tumor development, for of the remaining fifteen cases, five followed full-term pregnancies, five followed abortions, one a tubal pregnancy; in three the form was not stated. *Deciduoma malignum* is a clinical term, including several varieties of tumors, sarcomata, carcinomata, and mixed growths, all being derived from one or both of the component parts of normal decidua, connective tissue, or epithelium. Metastases form in various parts of the body (the vulva, in Williams's case), and present all the characters of the original tumor. In case the growth is derived from the stroma, it is a sarcoma; when from one or both layers of decidual epithelium, a carcinoma. Menge[34] has described a case in which both varieties occurred together. Histologically, the greater part of the tumor, as well as the metastasis, is made up of blood lying free in the tissues or enclosed in spaces formed by the tumor cells. In the carcinomata, the cellular portion consists of epithelioid cells derived from the Langhans layer of the decidual epithelium or of masses of syncytium, a protoplasmic network without definite division into cells, with deeply staining nuclei, vacuolated, the vacuoles being empty or containing a transparent substance. This syncytium, cut in various directions, gives the giant-cell appearance so often described, protoplasmic masses filled with nuclei, in the placenta; in short, it is merely a reproduction of the outer, probably maternal, layer of chorionic epithelium. No traces of blood-vessels are to be found and no reticulum. The epithelioid cells and syncytial masses are arranged without an attempt at formation, without connection with surrounding tissues. The sarcomata have the same blood spaces, surrounded, however, by connective-tissue cells with a well-marked stroma, no syncytium being present; the carcino-sarcomata present the combined features of these two tumors. When by cell proliferation the blood spaces are obliterated, the tumor undergoes central necrosis.

Clinically, the growth is of frightful malignity, death usually occurring within six months after the first appearance of symptoms. It soon infiltrates the uterine wall, destroying it, entering the blood stream, and reproducing itself in other parts. In view of the malignity of deciduoma,

early diagnosis is imperative, and in cases of hæmorrhage late in the puerperium or just following it, especially in a hydatidiform pregnancy, curettage of the uterine cavity should be done at once. If traces of deciduoma malignum are found, the uterus should be at once extirpated, if it is not already too late. (A complete bibliography, with illustrative histological plates, will be found in Williams's[33] article.)

Conditions of the Ovum, Embryo, and Fœtus, and Presentation of the Fœtus, in our 635 Cases of Untimely Interruption of Pregnancy.

Early Abortions.—Our statistical tables show that the ovum in our 242 cases of early abortion was expelled unruptured in only forty-two instances, or one-sixth of all cases; that in sixty-nine instances rupture of one or more envelopes of the ovum occurred before expulsion, resulting in an expulsion in a more or less broken-up condition, in one or other of the mechanisms already pointed out in foregoing sections.

Expulsion of the Ovum in Early Abortions.

	Cases.
Ovum expelled unruptured	42
Ovum expelled broken up	69
Not noted on histories	131
Total	242

Our tables further show that of our 242 cases of early abortion, 162 were of the incomplete variety; namely, the embryo had escaped, leaving behind the whole or a part of the secundines, when the Hospital official made his first visit. Further, of the 176 cases in which, when first seen, the embryo had escaped, only 14 were considered, from an examination of the decidua, to be "complete" abortions.

Regarding the nature of the remaining 66 cases, when first visited 48 were inevitable, of 12 we have no record, and 6 were threatened, but subsequently, in spite of treatment, aborted.

Character of the Early Abortions when First Visited.

	Cases.
Incomplete abortion	162
Inevitable abortion	48
Complete abortion	14
Not noted on histories	12
Threatened abortion	6
Total	242

Late Abortions.—The statement found among most classical authors, that, as a rule, in abortion the fœtus has ceased to live before its expulsion,

would appear to be strengthened by our observations, although some modern writers, notably of the French school, contradict this statement.

Condition of the Fœtus at Time of Birth in Late Abortions.

	Cases.
Still-born	106
Still-born and macerated	19
Lived a few minutes	6
Lived a few hours	3
No record on histories	41
Total	175

Spontaneous Premature Labor.—As regards the condition of the fœtus and the subsequent results for living children, we are at once impressed with the very small proportion of children alive at birth that survived even the short period of attendance, which in spontaneous premature delivery averaged 9 days and 7 hours.

After the establishment of a main Hospital building in November, 1894, when possible, cases of premature children were transferred to the Hospital wards and placed in the couveuse. By referring to the latter portion of our statistical table of premature labor, it will be seen that a number of such children were so treated. While the number of children so treated was small, still the results seen in even this small number were better than those of the ordinary treatment of the tenement houses.

Condition of the Child at Time of Birth in Premature Labor.

	Cases.
Still-born	47
Still-born and macerated	43
Lived a few minutes	4
Lived some hours	25
Lived some days	53
Living when discharged	32
No record on histories	34
Total	238

Twins, 20 cases.

In late abortions, as well as in spontaneous premature labors, the greatest interest, to the writer at least, centres about the relative frequency of the various presentations of the fœtus. We cannot but believe, as the result of an extended study of the literature of the subject, that this portion of the pathology of the premature interruption of pregnancy has been sadly neglected.

We find the repeated classical statement that at full term vertex presentations obtain in 95 per cent. of cases, and that the percentage is much

less prior to the delivery of a mature fœtus, but in what proportion few have attempted to enlighten us.

We believe the statements of Matthews Duncan and the later ones of Pinard are not disputed; namely, that during the first six months of gestation the superior segment or fundus of the uterus is more developed than the inferior, and, likewise, that during this period the head of the fœtus is relatively much larger than its body.

Further, during the first two-thirds of pregnancy, by reason of the liquor amnii, the fœtus enjoys certain liberties and readily moves about and changes its presentation and position; but as the last third of gestation progresses, the general movements become less and less, and the fœtus gradually assumes what are recognized as its normal attitude, presentation, and position. Up to the last third of gestation the total area of the uterine cavity far exceeds that of the fœtus, so that before this time and in the early part of the last third the tendency to accommodation is not absolute as it subsequently becomes.

Presentations of the Fœtus in Late Abortions.

	Cases.
Cephalic presentation	11
Podalic presentation	11
Shoulder presentation	0
Not noted on histories	153
Total	175

We observe in the foregoing table that of the 22 cases of late abortion in which the presentation was noted, this number is equally divided between cephalic and podalic presentations. This substantiates what we have already said regarding the accommodation or adaptation between the superior and inferior uterine segments and the relative size of the fœtal body and head.

Unfortunately, we have no records of the relative frequency of shoulder presentation to compare with the above.

Our table shows, however, that in the fourth, fifth, and sixth months of gestation, the fœtus being quite movable in the liquor amnii, the superior uterine segment being relatively larger than the inferior, and the fœtal head relatively larger than the body, the breech presents with equal frequency as the vertex (11 to 11).

Turning now to spontaneous premature labor and comparing the presentations here with those of late abortions, we observe a gradual increase in the proportion of vertex presentations and a lessening of the proportion of breech presentations. In the seventh, eighth, and ninth months of pregnancy the adaptation or accommodation of the cephalic and podalic extremities of the fœtus to the corresponding smaller and larger uterine segments respectively becomes more constant, and the fœtus gradually takes up the physiological posture of normal vertex presentation.

It will be observed, moreover, that while the number of shoulder pres-

entations is comparatively small (7 in 238 presentations), still the proportion is much greater than that of full-term delivery; namely, 1 in 34 presentations, as against 1 in 250 presentations.

Presentations of the Fœtus in Spontaneous Premature Labor.

	Cases.
Cephalic (vertex) presentation	129
Podalic (breech) presentation	55
Shoulder presentation	7
Not noted on histories	47
Total	238

The above table includes twenty cases of twin delivery, and we append the presentations in these cases separately, in the following table:

Presentations of the Fœtus in Twenty Cases of Spontaneous Twin Premature Labor.

	Cases.
Both twins cephalic presentation	6
Both twins podalic presentation	4
One cephalic and one podalic presentation	7
One cephalic and one not noted	1
One podalic and one not noted	1
Not noted on history	1
Total	20

Although, as we believe, little, if any, interest attaches to the subject, still we append the sex of child in our 238 children born in spontaneous premature delivery.

Sex of Child in Spontaneous Premature Labor.

	Cases.
Male	107
Female	113
Not noted on history	18
Total	238

We have endeavored, further, to establish from our cases of spontaneous premature delivery the connection and relationship existing between the various presentations, according as the fœtus be dead or alive. In the total number of 238 premature children, including living, still-born, twins, and still-born and macerated, there were:

	Cases.	
Cephalic (vertex) presentation	129 or	54.20%
Podalic (breech) presentation	55 "	23.12%
Shoulder presentation	7 "	2.95%
Not noted on history	47 "	19.23%
Total	238	

In the total number of 238 premature children, including the twenty twin cases:

	Cases.	
Fœtus was born living	114 or	47.89%
Fœtus was still-born	47 "	19.75%
Fœtus was still-born and macerated	43 "	18.07%
Condition not noted on histories	34 "	14.29%
Total	238	

In the 114, or 47.89 per cent., cases of the preceding table in which the fœtus was born alive, we find the following presentations:

	Cases.	
Cephalic (vertex) presentation	75 or	31.50%
Podalic (breech) presentation	22 "	9.24%
Shoulder presentation	2 "	0.84%
Not noted on histories	15 "	6.30%
Total	114	

In the 47, or 19.75 per cent., cases of our table in which the fœtus was still-born, we find:

	Cases.	
Cephalic (vertex) presentation	22 or	9.24%
Podalic (breech) presentation	14 "	5.88%
Shoulder presentation	3 "	1.26%
Not noted on histories	8 "	2.52%
Total	47	

In the 43, or 18.07 per cent., cases of our table in which the fœtus was both still-born and macerated, we find:

	Cases.	
Cephalic (vertex) presentation	21 or	8.82%
Podalic (breech) presentation	15 "	6.30%
Shoulder presentation	0	
Not noted on histories	7 "	2.94%
Total	43	

From the preceding three tables we can construct the following:

	Vertex.	Breech.
Living children	31.50%	9.24%
Still-born	9.24%	5.88%
Still-born and macerated	8.82%	6.30%

This table shows markedly the predominance of vertex presentations in fœtuses born alive (31.50 per cent. vertex, and 9.24 per cent. breech, in living fœtuses); moreover, the sharp decline in the excess of vertex presentations over breech when a still-born or still-born and macerated fœtus obtains (9.24 per cent. vertex and 5.88 per cent. breech in the former, and 8.82 per cent. vertex and 6.30 per cent. breech in the latter).

It would be of interest at this point to study the influence of the cause of the premature delivery upon the vitality and condition of the product of conception at the time of birth. For example, what proportion of the children were born living, still-born, and still-born and macerated in instances in which the cause of the interrupted pregnancy was known to be faulty implantation of the placenta (prævia), syphilis, and albuminuria (toxæmia) respectively

Brion[32] found that in vicious insertion of the placenta the fœtus was born most frequently alive; in syphilis, almost always still-born and macerated: and in albuminuria (toxæmia), the living and still-born children were of about equal proportion.

Study and investigation in this direction would doubtless aid us in the preventive treatment of subsequent interruptions of pregnancy in those instances in which only a suspicion of the real cause of the accident can be obtained from the clinical history of a patient. Although our histories do not permit us in any but a small proportion of our cases to state the cause of the accident (see Etiology), still the above reference to the relationship between the etiology and the condition of the child at birth is introduced here in order that in future reports upon untimely interrupted pregnancies the matter may be given due attention.

Bacteriology.

This division of the subject is introduced in the hope of forging an additional link in the chain of argument in favor of the active procedure adopted in most of our cases, as well as to place on record the results of certain bacteriological investigations which, to our knowledge, have not previously been made in prematurely interrupted deliveries both before and after operation and at the end of the puerperium. Puerperal infection is the same here, of course, as in full-term labors, sapræmia or septicæmia and pyæmia resulting from the invasion of saprophytic or pathogenic organisms in an identical fashion. Puerperal sapræmia, a term first used by Matthews Duncan,[35] signifies a poisoning of the organism from ptomaines resulting from putrefaction processes in the birth canal. Its advocates describe a complete symptom-complex for it. The saprophytes effect an entrance usually during a prolonged and difficult labor, and Ahlfeld[36] makes the statement that in well-conducted maternities the cases of fever from auto-infection and sapræmia outnumber those in which there is a direct contagion. Lately, this extreme view has been attacked. Bumm,[37] in 1891, discovered streptococci in eight of eleven cases with a clinical history of putrid endometritis, and von Franqué,[38] in a typical case of sapræmia, found only a pure culture of streptococci. He and Williams[38] regard the condition as rare in the puerperium.

No such uncertainty attaches to infection by pyogenic organisms. From the time of the appearance in 1861 of Semmelweiss's[46] paper, opening the question, the doctrine of infection in puerperal septicæmia has gained ground; and, thanks to the labors of numerous investigators (Mayrhofer[40] in 1865, then Rindfleisch,[52] Recklinghausen,[53] Waldeyer,[54] Klebs,[55] Orth,[56]

Spillman,[57] and others), the streptococcus was early recognized here, as in other wounds, as the chief offender. Pasteur,[41] in 1880, first cultivated it from the uterus of a woman dead of childbed fever. He was followed by many men (Fränckel,[58] Winckel,[59] Bumm,[60] Döderlein,[50] Winter,[61] etc.) whose names are a guarantee of their work. Brieger,[62] Czerniewsky,[63] Fehling,[64] Hägler,[65] and Döderlein[42] have reported cases in which the staphylococci were brought forward as the cause of milder cases of puerperal septicæmia, following out their rôle in other wound infections, their virulence being less than that of streptococci. Döderlein[42] has recorded an epidemic in Leipzig in which the two were found together. These, however, are not the only pyogenic microbes concerned in the causation of puerperal fever. König[43] has made a pure culture of gonococci from the uterus in nine cases; von Franqué[38] found the bacillus coli communis in pure culture in the uterus once; the bacillus proteus has been cultivated from ovarian abscess and fatal peritonitis (Flexner[44]) caused by it, and it seems probable that it will be found in cases of septicæmia, as Kuliscioff[66] surmised. Heyse[45] has recorded a case of puerperal tetanus in which the bacilli were found in the woman's cervix and the dust of her room.

Having established the fact that these organisms may be concerned in the origin of puerperal septicæmia, and granted the possibility of infection by putrefactive germs, the question arises, Are they always introduced by the attendant? Can a woman be infected by organisms which find their habitat in her genital tract before delivery; *i.e.*, suffer from auto-infection? Semmelweiss,[46] in the paper which laid the foundations of antiseptic midwifery, claimed that she might; and he has had able supporters (Ahlfeld,[36] Kehrer,[67] Kaltenbach,[68] etc.). Working along this line, investigators have reached various results; Gönner,[69] Thomen,[70] and others failing to find pathogenic organisms in women not previously examined, and Winter,[61] Döderlein,[50] Widal,[71] and Witte[72] discovering them in a large proportion of cases. Vahle[79] finds that the vaginæ of infants remain sterile for only twelve hours after birth. At the end of three days he discovered streptococci in 14.6 per cent., staphylococci in 4 per cent. of cases. Döderlein,[47] however, in his consideration of 195 cases, succeeded in explaining the discrepancy in these results. He discovered that there are two vaginal secretions, normal and pathological, the one containing yeast occasionally, epithelium, and a non-pathogenic bacillus vaginæ which secretes lactic acid; the other, numbers of micro-organisms (streptococci in 10 per cent. of cases). Williams[39] has confirmed these results in 15 cases, 4 of which were normal (55.3 per cent. Döderlein). In 8 cases, pyogenic microbes were discovered. Witte,[72] of Berlin, reports 53 examinations on the same lines. It must be granted that it lies within the realms of possibility for these pathological cases all to have childbed fever resulting from auto-infection. How can the enormous proportion (44.6 per cent. Döderlein) of these cases be reconciled with the results obtained by Mermann,[48] who shows a mortality of 6 per cent. in 900 labors, recording every fever over 100 degrees; by Leopold,[49] who in 919 finds just 2 cases, or 0.21 per cent., in which there was any possibility of auto-infection; and by Hofmeier,[78] with a mortality of

0.6 per cent. in 2,000 cases? Mermann used only subjective antisepsis; Leopold did not examine his women at all. It is apparent that something besides the mere presence of pathogenic microbes is needed to produce septicæmia, but what that something is we do not know. It is known, however, that streptococci and staphylococci have been introduced into fresh wounds without result (Bossowsky,[71] Welch[71]). Moreover, it is possible that the genital secretion, *e.g.*, the lactic acid formed by Döderlein's bacillus, as proved by Witte,[72] inhibits their activity, for pure cultures of streptococci have been found by Czerniewsky[63] and von Franqué[38] in healthy uteri. Krönig[75] has added by his researches further confirmation to this theory of inhibition. His cases number forty-eight. In them he found that not only is the vaginal secretion in normal pregnancy free from germs, but that it possesses actual germicidal power. This is true of both varieties of secretion, normal and pathological. Various organisms were introduced into the vagina. Streptococci were destroyed first, staphylococci and pyocyanei living twice as long. The resisting power of the tissues is the same to spores and cocci, the genital tract being free in two days, at the longest, after introduction. His conclusion is, that prophylactic syringing should be given up even in cases of gonorrhœa, since this germicidal power is lost thereby. Bumm[76] has recently stated that, aside from cases of acute septic, gonorrhœal, or tuberculous endometritis, chronic endometritis of the body and neck of the uterus is not of microbic origin. In some instances, microbes were found in the secretions, but never in the tissues, and they must be regarded as chance visitors of no importance. He does not believe that chronic endometritis is invariably due to acute or subacute septic or gonorrhœal infection, but grants that by microbic invasion the secretion may become purulent.

Menge,[77] discussing Bumm's statement, declared that in 71 examinations of uteri removed in Zweifel's clinic, he has never found, either in the secretions or tissues of the uterine or cervical cavities, any micro-organisms capable of existence on ordinary culture media. The same holds true as regards normal organs and in the presence of chronic endometritis. In view of these careful investigations, it seems probable, at least, that the uterus may, and often does, remain germ-free, even when the vaginal secretion is pathological, by virtue of its antiseptic power; and the mystery of a 0.6 per cent. mortality in 2,000 labors remains so no longer. Walthard[80] expresses the idea in another way—that the cervical canal is the border between those portions of the genital tract which are free from bacteria and those which contain them, and believes with Bumm that the saprophytic germs are non-virulent on healthy tissue, but become parasitic when the resistance of those tissues is diminished. The mechanism of labor throughout is, moreover, such as to offer the least opportunity for the entrance of organisms from the vagina and cervix into the uterus. With regard to auto-infection as to sapræmia, while its existence must be admitted, the number of actual cases is small enough to be passed over.

Twelve of our cases were examined bacteriologically, tube cultures being made in the usual way, with a swab, through a sterilized glass tube,

from vagina and uterus, both before and after operation and at the end of the puerperium; four cultures in most instances, and in some, six, as cultures at the end of the puerperium were not always obtained. The vagina was found to be sterile in two cases of the 12; *i.e.*, no growth of bacteria appeared on the media. Of the pathogenic organisms occurring in six cases, or 50 per cent., the streptococcus appeared once with the diplococcus subflavus of Bumm; the staphylococcus albus twice, with the bacillus coli communis once, alone once; the staphylococcus aureus, once with the bacillus coli communis; the bacillus coli communis with the bacillus fluorescens liquefaciens once, besides the instances mentioned. Red yeast was cultivated from one vagina, and Bumm's diplococcus albicans from another. A plate exposed half an hour in the room of the patient in the first of the latter two cases showed colonies of sarcina, red yeast, penicillium glaucum, staphylococcus albus, and bacillus subtilis and liquefaciens. In one of the cases in which staphylococcus albus and bacillus coli communis occurred together, an air plate from the room showed besides various fungi only the staphylococcus. (Two of the twelve tubes were broken in transit.) In these examinations, then, the white staphylococcus figured three times, the bacillus coli communis four times, the golden staphylococcus and streptococcus once each.

Below is a table showing these results:

Case Number.	ORGANISMS FOUND.			
	VAGINA.		UTERUS.	
	Before Operation.	After Operation.	Before Operation.	After Operation.
7,211	Red yeast.	(Air plate.)	Sterile.	Sterile.
7,465	Staph. aureus. Bac. coli com.	Sterile.	Sterile.	Sterile.
7,683	Sterile.	"	"	"
7,177	(Broken.)	"	"	"
7,167	Staph. albus. Bac. coli com.	Staphylococcus albus.	"	"
7,107	Diplococcus albic.	Sterile.		
7,034	Staph. albus. Bac. coli com.	Bacillus coli com.	"	"
7,029	Streptococcus. Diplococcus subf.	.....	"	"
7,022	Sterile.	.....	"	"
6,924	(Broken.)	Sterile.	"	"
6,909	Staph. albus.	"	"	"
6,891	Bac. coli com. Bac. fluorescens.	"	"	"

After operation, in seven cultures, five, or 71.4 per cent., were sterile, the other two showing bacillus coli communis and staphylococcus once each. Thirteen examinations of uteri were made before operation without the discovery of an organism of any kind, and the same result was obtained in eleven instances immediately after operation. One culture made from the vaginal fornix, at the end of the puerperium, showed the white staphylococcus.

Case 6,880 gave sterile culture from the uterus before operation; case 6,915, staphylococcus albus in the vagina at the end of the puerperium; case 6,855 showed the same in the vagina, the uterus being sterile at the end of the puerperium.

These investigations bear out in a striking way Döderlein's[50] assertion that the uterus of the *normal* lying-in woman is germ-free. No division was made in them into normal and pathological, but it seems fair to infer that, even in the presence of a pathological vaginal secretion, the uterus may persist in its freedom from invasion. No mention is made by the bacteriologist of the vaginal bacillus of Döderlein. The occurrence of the bacillus coli communis is in greater proportion than previously reported (25 per cent.); this is not a surprising condition, however, considering the proximity of the rectum, its ordinary habitat. Bumm[51] declares that inoculation upon animals is necessary to prove the virulence of these organisms, and he seems to be correct, in view of the minute proportion of autoinfection in Mermann's and Leopold's reports. It has not been done in any of our cases, but it is interesting to compare the clinical histories with the bacteriological findings.

Case 6,855.—Abortion (?). Fœtus passed forty-eight hours before examination. Placenta and membranes found in uterus and removed manually. Uterus curetted. Douche of sublimate solution ($\frac{1}{8000}$) and packing of iodoform gauze. Ten days later, a culture from vagina showed staphylococcus albus, uterus sterile. No fever. (Absence of fever in presence of staphylococcus albus.)

Case 6,880.—Primipara; seventh month gestation; seen in second stage of labor, which lasted nine hours. Temperature, 101.2 degrees; pulse, 107 when seen; placenta manually extracted, adherent, markedly fatty, and torn in extraction. Duration of third stage, thirty minutes. Pieces of placenta left in uterus removed as far as possible. Twenty-four hours later, temperature, 103; pulse, 120. Chloroformed, external genitals and vagina cleansed with lysol (five per cent.) and sublimate solution ($\frac{1}{1000}$). Uterus curetted with dull curette. Pieces of placenta and membranes brought away. Irrigated uterus with sublimate solution ($\frac{1}{8000}$) and packed it with gauze. Chill immediately followed. Temperature, 104 degrees; pulse, 120. Temperature, 101 to 103 degrees for four days. Gauze removed on second day. Examination showed uterus bound down, and parametritis. After treatment, intrauterine and vaginal douches. No foulness of lochia. Discharge on tenth day. No pyrexia. Pulse normal. Culture from uterus showed absence of any organisms before operation. (Fever, with no organisms present in uterus.)

Case 6,891.—II. para, age 31, third month. Abortion brought about by strain forty-eight hours before being seen. Bleeding and pain. Uterus sensitive, large, anteflexed; shreds of membranes hanging from os. Culture from vaginal fornix showed colonies of bacillus coli communis and bacillus fluorescens non-liquefaciens. Cervix dilated with sterilized Goodell dilator, and culture taken from fundus, which was found to be sterile. Uterus irrigated with sublimate solution ($\frac{1}{8000}$) and curetted with dull and sharp curette. No fœtus found. Pieces of membrane removed. After operation, culture from fornix, which remained sterile. Vagina previously wiped with absorbent cotton. Uterus packed with iodoform gauze. Removed after seventy-two hours. Discharged on fifth day. No pyrexia. (Bacillus coli communis present, without fever.)

Case 6,915.—IV. para, fourth month. First seen August 20, 1894, at 11.30 A.M. Temperature, 101 degrees; pulse, 72. Headache and dizziness for two weeks past. Hæmorrhage and pain during last twenty-four hours. External os open. Seen again after seven hours. Vagina filled with clots. Os admits two fingers, and membranes protrude. Ovum removed intact. Temperature, 99.2 degrees; pulse, 80. After five and a half hours, ether given and uterus curetted. A few pieces of membrane and clots removed. Uterus irrigated with sublimate solution ($\frac{1}{10000}$) and packed with iodoform gauze. Gauze removed after five days. No fever after curettage. No fetor in lochia. Discharged on tenth day. Culture made from posterior fornix at end of puerperium showed staphylococcus albus. (No fever after curettage with staphylococcus present.)

Case 6,924.—VII. para, age 30. One previous abortion. Third month. First seen August 21, 1894. Temperature, 100 degrees; pulse, 108. Vagina full of clots. Placenta protruding from os. Culture from posterior fornix broken in transit. External genitals and vagina cleansed with soap and water, lysol solution (five per cent.), and sublimate ($\frac{1}{1000}$). Culture from fundus of uterus sterile. Placenta removed, uterus curetted, and irrigated with sublimate solution ($\frac{1}{8000}$). Second culture from fundus uteri and fornix both sterile. Curetting removed several pieces of membrane. Uterus packed with gauze, which was removed after seventy-two hours. Temperature, 100.6 degrees; pulse, 114 on third day; temperature, 101.8 degrees; pulse, 107 on sixth day. Constipation throughout puerperium. No odor from lochia. Discharged on eleventh day. (Fever, with sterile cultures.)

Case 7,022.—II. para, age 24, third month. First seen September 3, 1894, at 1.30 A.M. Found patient suffering from hæmorrhage, with fœtus lying in bed. Pain and hæmorrhage for five hours. Packed with iodoform gauze, which was removed after ten hours, and placenta found in os. Cultures from fornix and fundus both sterile. Uterus irrigated, curetted, irrigated again, and second culture taken from it also sterile. Placenta and membranes rotten; fœtus evidently dead some time previously. Gauze removed from uterus at end of forty-eight hours. No record of pulse and temperature before operation; afterwards, pulse, 106; temperature, 101.1 degrees. Fever undoubtedly present when first seen. (Fever case, with rotten decidua, but no bacteria or other organisms discoverable.)

Case 6,909.—II. para, age 19. When first seen, fœtus found in bed, vagina filled with clots, and placenta in cervix. Vagina packed with sterilized gauze. After ten hours, operation under ether. Genitals and vagina cleansed in usual way. Uterine douche of bichloride ($\frac{1}{8000}$). Scraped with dull curette and decidua removed. Again douched with sublimate solution. No fever. Discharged on seventh day. Culture from vagina before operation showed staphylococcus albus. Other three cultures sterile. (No fever in presence of staphylococcus albus.)

Case 7,029.—VII. para, age 32, two and one-half months. Seen first September 3, 1894. Gave history of pain and hæmorrhage for a few days past. Had passed pieces of decidua. Curettage shortly after. Decidua, but no fœtus, removed. Uterus packed with gauze, which was removed four days after. No fever. Discharged on seventh day. The streptococcus and diplococcus subflavus were found in the vagina before operation; the uterus sterile throughout. (No fever. Streptococcus in vagina.)

Case 7,034.—III. para, age 34, fourth month. Seen September 3, 1894. Hæmorrhage for week past. Sharp hæmorrhage at time of visit; temperature, 100 degrees; pulse, 90. Fœtus at vulva attached to placenta. Uterus curetted, removing decidua. Uterus and vagina packed with gauze, which was removed in four days. No pyrexia, no lochial odor. Discharged on eleventh day. Culture from vagina before operation showed bacillus coli communis with staphylococcus albus; after operation, bacillus alone, while uterus remained sterile. (Virulent pathogenic organisms, with no fever.)

Case 7,107.—VII. para, age 30. Seen September 13, 1894. Bleeding for one week. Treated by midwife and private physician. Pale, exsanguinated, chills; temperature, 99 degrees; pulse, 110. Uterus one and one-half inch above pubis, and sensitive. Cervix hard and closed. Vagina hot and dry. Curetted. Decidua and small piece of placenta removed. Packed. No fever, no tenderness of uterus. Diplococcus albicans of Bumm found in vagina before operation. No organisms discovered there afterwards. (No fever and no pathogenic organisms.)

Case 7,167.—X. para, age 42, eighth month. Placenta adherent to uterine wall and manually removed. Douched with sublimate solution ($\frac{1}{15000}$). Temperature a few hours after labor, 101.4 degrees; pulse, 92. Temperature, 101 to 103 degrees for four days. Third day, tympanitic and tender abdomen. Large, soft uterus. Curetted, removing small pieces of decidua; douched and packed uterus. Gauze removed on fourth day. Temperature, 101 degrees on fifth day. Discharged on eleventh day in fair condition. The staphylococcus albus found in vagina before and after operation; bacillus coli communis in combination before. Uterus sterile. (Fever, septicæmia, with bacillus coli and staphylococcus present in vagina.)

Case 7,177.—II. para, age 29, third month. Midwife in attendance two days when seen. Uterine hæmorrhage persistent. Uterus curetted, douched, and packed. Gauze removed in four days. No fever. No

lochial odor. Discharged on tenth day. Tube from vagina before operation broken; other three cultures sterile. (No fever, no organisms.)

Case 7,683.—III. para, age 28, fourth month. Fœtal head found protruding from vagina. Fœtus removed manually; placenta and membranes adherent. A few hours later curetted, washed, and packed uterus with gauze, which patient removed, substituting a sponge. No fever. Discharged in good condition. Sterile cultures throughout. (No fever. No organisms.)

Case 7,465.—Four previous abortions. Three and one-half months. Pain and hæmorrhage. Vagina full of clots. Uterine cavity three inches long. Fœtus and placenta found in clots discharged. Curetted, douched, and packed. Gauze removed on third day. Lochia sweet. No fever. Discharged eighth day. Culture from vagina before operation showed bacillus coli and staphylococcus aureus; the other three sterile. (No fever, with bacillus coli and staphylococcus aureus present.)

Case 7,211.—IV. para, age 26; third month. Had bled profusely. Vagina packed with gauze. Four hours later uterus scraped, douched, and packed. Mass of decidua removed. No fever or other complications. Patient removed gauze on third day, and refused further treatment. Red yeast only was found in the four cultures, although a plate exposed to air of room showed colonies of staphylococci. (No fever and no pathogenic organisms.)

These fifteen histories furnish some curious data and not a little food for reflection. Among them we find an absence of temperature above 100.5 degrees and of other symptoms of infection in childbed no less than seven times (46.6 per cent. of cases, or nearly one-half), when organisms of whose virulence under ordinary conditions there can be no doubt were found in the vagina before and often after operation, possibly continuously present. If any inferences can be drawn from so small a number, there must be some virtue in genital antisepsis, or else vaginal secretions diminish to a marked degree the pathogenic power of these microbes. Hardly less striking are the three cases (20 per cent.) in which fever and, in case 7,022, a marked degree of septicæmia with putrid decidua occurred without a growth of any kind appearing on the media. Four times the natural order of coincident absence of fever and micro-organisms appeared (26.6 per cent.), and once, that of presence of the two (6.6 per cent.). In other words, of the fifteen cases, four had symptoms of septic infection and one only showed pyogenic microbes in her secretions. There was no interference by midwives in this instance, and the continuous presence of the staphylococcus albus in the vagina, with the addition of the bacillus coli, before operation at least, appears to offer some ground for the theory of auto-infection.

A chapter on the bacteriology of the lying-in period cannot be considered complete without some mention of the gonococcus. It was not found in our observations, the people from whom they were drawn enjoying a remarkable immunity from venereal disease. The present state of our knowledge of gonorrhœa of the uterus has been satisfactorily summed up

by Wertheim[81] at the recent meeting of the German Gynæcological Society. His deductions are these: next to the urethra, the uterus is the most frequent seat of disease. Infection is usually direct, and is often confined to the uterus alone. Gonorrhœal vaginitis is comparatively a rare affection. An acute and chronic stage of uterine gonorrhœa is clinically distinguishable, although a sharp line cannot be drawn between them. Infection gives rise to purulent endometritis, the secretion containing numberless cocci; but as the discharge lessens, they become fewer, and are replaced by other bacteria. Wertheim found cocci in eight of eighteen uteri removed, failing to discover them in six cases with clear history. There is almost always an acute interstitial endometritis present, resulting finally in infiltration of the muscle, with hyperplasia of the vessel walls, and a replacement of the muscle fibres by connective tissue. Enlargement and pain in the organ are evidences of this condition. In a certain number of chronic cases there is, besides an increase of the glandular structure, glandular endometritis. Inflammatory change becomes less marked as the external os is approached. Gonococci are found most readily in the mucosa, with difficulty in the deeper tissues. Mixed or secondary infection is as rare as in gonorrhœal salpingitis. The internal os offers no barrier to the ascent of the process, shown by the presence of cocci in the endometrium when the adnexa were apparently healthy (five cases examined). Exacerbations are due to menstruation, coitus, and intrauterine treatment, dependent on alterations in the nutritive medium, although there is always a possibility of reinfection. The puerperium is a peculiarly unfavorable state, since an invasion of previously unaffected parts takes place frequently.

Etiology.

A study of our 635 cases of the untimely interruption of pregnancy shows that the causes of the accident have but rarely been positively ascertained. It must be remembered in this connection that all of the 635 cases treated were cared for in an outdoor dispensary practice, in the patients' own homes; that the majority (see Table of Nativity) was made up of the ignorant foreign population of the lower East Side of the city, many of whom had been but a short time in this country, and, through ignorance, were unable to give anything approaching a definite history regarding the character of their preceding interrupted pregnancies, labors at term, puerperia, or preëxisting uterine disease.

Records of the evidence of preëxisting or present disease of the uterus are lacking in most of our histories, and this fact is partly explained by the nature of our service and the comparatively short time that patients would submit to treatment. For example, the average duration of after-treatment was as follows:

AVERAGE DURATION OF TREATMENT.*

Early abortions	7 days 8 hours.
Late abortions	7 days 21 hours.
Premature labors	9 days 7 hours.

The first visit and first examination of the patient in our early and late abortions were usually made by one of the resident staff officers, after the lapse of a considerable period from the onset of the first symptoms. This is shown in the subjoined table:

DURATION OF SYMPTOMS WHEN FIRST SEEN.

	EARLY ABORTIONS. 129 Observations.	LATE ABORTIONS. 57 Observations.
Average duration	3 days 22 hours.	6 days 19 hours.
Longest "	3 weeks.	7 weeks.
Shortest "	10 minutes.	1 hour.

The staff physician at this first examination endeavored to ascertain only those conditions which call for immediate treatment; for instance, in abortion the amount of hæmorrhage and the character of the abortion. In this way the more minute changes in the condition of the uterus and its appendages, which are associated with preëxisting or present uterine disease, escaped observation. This fact is true of our earlier cases, but only partly true of our later ones. For since the appointment of a bacteriologist to the Hospital in 1894, bacteriological examinations of blood, of uterine and vaginal secretions, both before and after operative interference, have been made. Moreover, decidual scrapings have been preserved and subjected to examination for evidences of disease (see Bacteriology and Pathology).

* DURATION OF TREATMENT.—ABORTION CASES.

	EARLY ABORTIONS. 206 Observations.	LATE ABORTIONS. 157 Observations.
Average duration	7 days 8 hours.	7 days 21 hours.
Longest "	28 days.	18 days.
Shortest "	1 day.	1 day.

DURATION OF TREATMENT IN SPONTANEOUS PREMATURE LABOR CASES.
In 143 Observations.

Average duration,	9 days 7 hours.
Longest "	40 days.
Shortest "	1 day.

Undoubtedly particular stress should be laid upon certain anomalies occurring in previous untimely interruptions of pregnancy, labors at term, and puerperia, as these usually are the first expression of beginning uterine disease or the direct precursor of such, but unfortunately our histories forbid any accurate statements in this direction. As has been frequently pointed out by different observers,* a striking feature in the study of etiology is the number of preceding premature interruptions of pregnancy.

To render this point more graphic in regard to our cases, we have constructed the following tables.

Previous Untimely Interruptions of Pregnancy in Abortion Cases.

23	abortion	cases	experienced	.....	1	previous	abortion.
6	"	"	"	.....	2	"	abortions.
4	"	"	"	.....	3	"	"
1	"	case	"	.....	4	"	"
2	"	cases	"	.....	5	"	"
2	"	"	"	.....	6	"	"
38							

54	abortion	cases	experienced	..	1	previous	premature	labor.
17	"	"	"	..	2	"	"	labors.
15	"	"	"	..	3	"	"	"
12	"	"	"	..	4	"	"	"
4	"	"	"	..	5	"	"	"
1	"	case	"	..	6	"	"	"
103								

Total number of abortion cases that experienced previous abortions, 38, or 9.1 per cent.

Total number of abortion cases that experienced previous premature labors, 103, or 24.7 per cent.

Total number of abortion cases that experienced previous untimely interrupted pregnancies, 141, or 34 per cent.

Previous Untimely Interruptions of Pregnancy in Premature Labor Cases.

13	premature	labor	cases	experienced	...	1	previous	abortion.
1	"	"	case	"	...	2	"	abortions.
1	"	"	"	"	...	3	"	"
15								

* Winckel and Stumpf found among 155 of their multiparæ who aborted, 59, or 38 per cent., who had previously suffered from interrupted pregnancies; among 92 with immature labor, 26, or 28.5 per cent.; among 101 with premature labor, 18, or 17.8 per cent.; and in 8 of these 103 cases with preceding untimely labors, every pregnancy had been a premature one; 3 were abortions, 4 immature labors, and only 1 premature labor.

17	premature	labor	cases	experienced	1	previous	premature	labor.
16	"	"	"	"	2	"	"	labors.
8	"	"	"	"	3	"	"	"
1	"	"	case	"	4	"	"	"
1	"	"	"	"	5	"	"	"
1	"	"	"	"	6	"	"	"
44								

Total number of premature labor cases that experienced previous abortions, 15, or 6.9 per cent.

Total number of premature labor cases that experienced previous premature labors, 44, or 20.2 per cent.

Total number of premature labor cases that experienced previous untimely interruptions of pregnancy, 59, or 26 per cent.

The most striking fact shown in the foregoing tables is the large number of previous untimely interruptions of pregnancy in our cases; for, as the tables show, among 417 women who aborted (using the term in its broad sense), 141, or 34 per cent., suffered from previous premature interruptions of pregnancy; and among our 218 cases of premature labor, 59, or 26 per cent., experienced previous untimely interruptions of pregnancy.

Again, the fact that those patients who aborted, and not the premature labor cases, were those who previously had suffered most from former premature interruptions of pregnancy (34 per cent. as against 26 per cent.), substantiates the well-known axiom, referred to in another place in this article, that the longer existence of uterine disease leads to an ever earlier interruption of pregnancy.

Traumata and fright were frequently averred by our patients as exciting causes of interrupted pregnancy; but such statements, coming from the patients themselves, have generally been disregarded.

Criminal Abortion.—The suspicion of criminal abortion was attached to a number of the cases here studied, but in what proportion criminal interference entered as an etiological factor is unknown.

Although in only 21 of our 417 cases of abortion do the histories indicate that midwives were in attendance, still we have reason to believe that the midwife was responsible for a number of these premature interruptions of pregnancy. It is a significant fact that the professional card of a midwife was frequently found in the patient's apartment upon the arrival of the physician from the Hospital.

We have ascertained that the most common method of criminal interference among the patients studied in this article is for the midwife, or the patient herself, instructed previously by the midwife, to rupture the membranes by means of a knitting-needle passed through the os. One druggist on the lower East Side is said to do a large business in tupelo tents sold to midwives; for what purpose can easily be conjectured.

Statements of the more intelligent midwives are to the effect that the Italians of the district covered by this report make use of the oil or the fluid extract of sabina (Juniperus sabina) to terminate an inconvenient

pregnancy, and, further, that the drug accomplishes the desired result within twenty-four hours of the first dose.

In none of our cases was legal inquiry set on foot, since direct proof of criminal interference could never be obtained.

Porak,[86] from his study of his 326 cases of early and late abortions, could ascertain the cause of the accident in but few instances, but found the most frequent anatomical cause to be alterations in the decidua, resulting in thickening and strong adhesion of the decidua to the uterine wall, after expulsion of the ovum.

The microscopic examination of the decidual scrapings in our cases was only set on foot toward the end of our series of 417 cases, and we have reports of only seven cases to offer, the findings in which are practically negative. (See Pathology.)

Porak[86] found the accident, in his remaining cases, due to traumatism, 32; syphilis, 32; mental emotions and fatigue, 22; retroversion of the uterus, 13; cardiopathy, 13; typhoid fever, 13; pulmonary tuberculosis, 13; albuminuria and eclampsia, 12; twin pregnancy, 10; defective insertion of the ovum, 10; and scrofula, 8.

Brion's[82] critical study of 530 cases of abortion is most instructive, as well as interesting. In only 163 of his 530 cases, or about one in four, was he able to ascertain the cause of the accident.

The causes in the 163 cases were as follows:

	Cases.
Faulty insertion of the placenta	64
Syphilis	52
Albuminuria	27
Hydramnios	13
Malformations and malpositions of the uterus	7
Total	163

Brion narrows down the causative factors to the above mentioned, and draws attention to the fact that in 143 of his 163 cases of abortion the causative factors were (1) faulty insertion of the placenta, 64 cases; (2) syphilis, 52 cases; (3) albuminuria, 27 cases. He refers to the statement of Baudeloque, namely, that "the insertion of the placenta near the cervix provokes abortion," and to the recent teachings of Pinard, who insists upon the influence of a faulty insertion of the placenta at the internal os as a frequent causative factor in the production of an abortion.

Brion's[82] conclusions regarding the 64 cases of faulty insertion of the placenta are founded upon careful inspection and measurements of the membranes in each case. The interest in his study centres around the two conditions—faulty or low implantation of the placenta, and albuminuria (toxæmia), as the two main causative factors in the etiology of his cases. His conclusions in this direction were the result of methodical and painstaking examinations of the decidua, placenta, membranes, and urine in every woman under his charge.

According to Pinard and Fehling, renal alterations (insufficiency,

nephritis) cause decidual hæmorrhages, and the character of the abortion will depend upon the quantity or the greater or less repetition of these hæmorrhages.

Brion[82] does not pretend to limit the etiology of abortion to these three causes (faulty insertion of the placenta, syphilis, and renal disease), but merely aims to show what in his opinion are the most frequent causes. He predicts that the more carefully we study the etiological factors of our cases the fewer will we find falling outside of these three causes. He pleads, moreover, for a future consideration of these three causes in formulating the etiology, prognosis, diagnosis, and treatment of abortion. His studies induce him, when in the presence of an abortion, the cause of which is not evident, not to ascribe the condition to criminal interference.

It may here be asked what were the etiological factors in our 417 cases of abortion. We reply we do not know. We do not know, because few, if any, of our cases were under observation at the onset of the attack; because it was not granted to us to make urinary analyses before the occurrence of hæmorrhage; and because, in our earlier cases, postpartum examinations of the urine were not made; and because the results in the few recent cases in which the urine was examined, were practically negative.

In only six instances of the 242 early abortions was the Hospital physician summoned at the time the abortion was threatened; in only 48 was the condition inevitable; so that in the remaining 188 cases the conditions were those of complete (14) or incomplete (162) abortions.

In late abortions our histories indicate only the following conditions as the probable causes of the accident:

Causes of Late Abortions.

	Cases.
Death of fœtus (cause unknown)	106
Death and maceration of fœtus (cause unknown)	19
Multiple (twin) pregnancy	2
Faulty implantation of placenta (prævia)	2
Nephritis and cardiac disease	1
Acute syphilis and cardiac disease	1
Albuminuria (toxæmia)	1
Retroflexion	1
Hydatidiform mole	1
Alcoholism	1
Unknown cause	40
Total	175

Spontaneous Premature Labor.

In spontaneous premature labor, on the other hand, the cause of the accident was quite frequently determined, for the reason that, as a rule, these of our cases were first seen by a Hospital official either in the first or second stage of labor. Thus, the following table indicates the period in

the progress of labor at which our 218 cases of spontaneous premature labor were first visited:

	Cases.
In the first stage of labor	125
In the second stage of labor	58
In the third stage of labor	20
Not noted on histories	15
Total	218

It will thus be seen that the majority (183) were under observation either in the first or in the second stage of labor, and this fact enables us to formulate the etiology in a certain number of cases. The facts ascertained appear in the following table:

Causes of Premature Labor.	Cases.
Death of fœtus	47
Death and maceration of fœtus	43
Multiple (twin) pregnancy	19
Faulty implantation of placenta (prævia)	7
Faulty implantation of placenta, and twins	1
Albuminuria (toxæmia)	5
Syphilis	1
Syphilis and hydramnios	1
Antepartum pneumonia	1
Pulmonary tuberculosis	2
Cause unknown	91
Total	218

Our etiological tables of late abortions and spontaneous premature labors leave, as will be seen, the cause of the accident in a large number of instances practically unknown, for the reason that the cause of fœtal death and maceration in the cases here studied is undetermined.

The part played by paternal and maternal syphilis, by toxæmia (albuminuria), and other causes of intrauterine death of the fœtus which escaped observation, we can only conjecture. That all causes which kill the fœtus may produce premature interruption of pregnancy, no one questions.

The large number (20) of multiple pregnancies found among the spontaneous premature labors is interesting. The same may be said of faulty implantation of the placenta (8 cases).

Pinard has shown, as already referred to in quoting Brion's statistics of the causation of early abortions, that spontaneous premature labor is due, in a large proportion of cases, to the insertion of the placenta in the inferior segment of the uterus. Pinard has furthermore shown that the premature rupture of the membranes, which, as a rule, accompanies a low implantation of the placenta, is the determining cause of the premature interruption of pregnancy.

In regard to our 91 cases of spontaneous premature labor in which the cause was unknown, it must not be forgotten that certain women always have short pregnancies, and children that, though undersized, do well.

PROGNOSIS.—COMPLICATIONS.

1. *Hæmorrhage.*

Hæmorrhage is a complication of importance. Misrachi[83] found in 92 cases the curette indicated for it 13 times, as against four cases of sepsis. (His controversy with Porak on this subject will be found reviewed under Treatment.) The statistics of our cases offer us no valuable data as to the frequency of hæmorrhage and the necessity of interference for it, since an early intervention has been the custom of the Hospital physicians, this having for its object not merely the prevention of sepsis, but subsequent hæmorrhage as well, in a class of patients prone to neglect abortions. Persistent hæmorrhage, though slight, induces a condition of weakness eminently predisposing to infection later. Stumpf shows after-hæmorrhages in 4.1 per cent. of his cases under expectant treatment, and in 13.3 per cent. of those manually treated.

A study of our statistical tables shows that hæmorrhage as a prominent symptom was noted in 207, or 85.57 per cent. of our 242 cases of early abortion before treatment. This agrees with what has already been stated (see Classification) regarding the frequency of hæmorrhage in early abortions. After treatment in early abortions, we find the record of but one case of hæmorrhage.

It will be seen under the head of Treatment that 214 of these 242 cases of early abortion were subjected to active treatment; namely, curettage, and that in 129 instances the operation was performed immediately after arrival of the Hospital physician. We look upon these results as an additional argument in favor of an active treatment.

In our 175 cases of late abortion, we find hæmorrhage as a prominent symptom before or during delivery in 116 instances, or 66.29 per cent. of cases. After delivery and treatment, we find but five instances of hæmorrhage. Referring once more to Treatment, it will be seen that 111 of these 175 cases were subjected to curettage, and that the operation was performed at once in 55 cases. Regarding the third stage of labor, its average duration was 44 minutes. The placenta was spontaneously delivered in 35, expressed in 19, manually removed in 26, instrumentally removed in 87, and of 8 cases we have no record.

In our 218 cases of spontaneous premature labor, hæmorrhage before or during delivery is noted in 14 instances, or 6.42 per cent., and hæmorrhage after delivery in 4 cases. Among our premature cases are eight of placenta prævia. In this connection it is interesting to note that the average duration of the third stage of labor in our premature cases was 23 minutes.

HÆMORRHAGE AS A COMPLICATION.

635 Cases.

	Before Treatment.	After Treatment.
Early abortions (242).....	207 cases, 85.57%	1 case.
Late abortions (175).....	116 cases, 66.29%	5 cases.
	Before Delivery.	**After Delivery.**
Spontaneous premature labor (218)	14 cases, 6.42%	4 cases.

2. *Retention of the Placenta, and Prolonged Third Stage.*

No statements regarding the frequency of the retention of the placenta and a prolonged third stage can be given, common complications though they are, for two reasons. The patient's statements are untrustworthy, and are rejected when she is seen at that period first. Secondly, the third stage with us is not permitted to continue, but is cut short by active measures, such as expression, manual or instrumental removal of the placenta, unless spontaneously brought to a close within half an hour.

Perhaps we cannot render our results more graphic in this connection than by constructing from our statistical synopsis two tables, placing in juxtaposition the methods of placental delivery and the duration of the third stage of labor in both late abortions and spontaneous premature labors. As we have already stated, we have been able to recognize a third stage of labor in but very few of our early abortions.

Methods of Placental Delivery in Late Abortions and Spontaneous Premature Labors.

	Late Abortions.	Premature Labors.
Spontaneous delivery	35	48
Expressed	19	147
Manually removed	26	20
Curettage after removal	87	6
No record	8	9
Total	175	230

Duration of the Third Stage of Labor in Late Abortions and Spontaneous Premature Labors.

	Late Abortions.	Premature Labors.
Average duration	44 minutes.	23 minutes.
Longest duration	3 hrs. 45 min.	1 hr. 30 min.
Shortest duration	5 minutes.	2 minutes.

Compare Hæmorrhage as a Complication, and Results of Treatment.

3. *Septic Infection. Fever.*

Fever as a Complication in the Untimely Interruption of Pregnancy.—We should state here that as regards the limit of the normal temperature ante, intra, or post partum we have accepted the definition of Leopold[81] and others, who place this limit at 38 degrees Centigrade or 100 degrees Fahrenheit, so that in the different classes of intra and post partum fever here studied, any temperature of 100.5 degrees Fahrenheit or over is looked upon as fever and a pathological condition.

Fever as a Complication in Early Abortions.—Our tables and critical study of the 242 cases of early abortion show that fever entered into the

cases as a complication either before or after the date when the cases were first seen by one of our physicians, in 28 instances, or 11.57 per cent., and that in these 28 cases the origin of the fever was as follows:

	Cases.
Fever due to sepsis	17
" " pulmonary tuberculosis	2
" " constipation	2
" " pneumonia	2
" " unknown cause	5
Total	28 or 11.57%

Further, that of these 28 cases of fever, 9 cases, or 32.18 per cent., were suffering from fever when first seen; 13 cases, or 46.57 per cent., developed fever in the service of the Hospital; 6 cases, or 21.29 per cent., have no record of the temperature when first seen.

Of the 9 cases, or 32.18 per cent., suffering from fever when first seen, the fever was due to:

	Cases.
Sepsis	8
Tuberculosis	1
Total	9 or 32.18%

Of the 13 cases, or 46.57 per cent., that developed fever in the service of the Hospital:

	Cases.
Fever due to sepsis	7
" " tuberculosis	1
" " constipation	1
" " cause unknown	4
Total	13 or 46.57%

Of the 6 cases, or 21.29 per cent., having no record of the temperature when first seen, subsequently developed fever due to:

	Cases.
Sepsis	2
Constipation	1
Pneumonia	2
Unknown cause	1
Total	6 or 21.29%

Fever as a Complication in Late Abortions.—Again our tables show that of the 175 cases of late abortion, fever appears as a complication in 38

instances, or 21.71 per cent., and that in these 38 cases the origin of the fever was as follows:

	Cases.
Fever due to sepsis	27
" " constipation	5
" " bronchitis	1
" " mastitis	1
" " sepsis and mastitis	1
" " unknown cause	3
Total	38 or 21.71%

Further, of these 38 cases of fever, 20 cases, or 52.63 per cent., were suffering from fever when first seen; 15, or 39.45 per cent., developed fever in the service of the Hospital; and 3, or 7.89 per cent., have no record of the temperature when first seen.

Of the 20, or 52.63 per cent., suffering from fever when first seen, the fever was due to:

	Cases.
Sepsis	16
Constipation	2
Unknown cause	2
Total	20

Of the 15, or 39.45 per cent., that developed fever in the service of the Hospital, the fever was due to:

	Cases.
Sepsis	8
Constipation	3
Bronchitis	1
Mastitis	1
Sepsis and mastitis	1
Unknown cause	1
Total	15

Of the 3, or 7.89 per cent., that have no record of the temperature when first seen, the fever was due to:

	Cases.
Sepsis	2
Unknown cause	1
Total	3

Fever as a Complication in Spontaneous Premature Labor.—Of the 218 cases of premature labor, our tables show that fever entered as a complication into 42 cases, or 19.27 per cent., and that in these 42 cases the cause of the fever was as follows:

	Cases.
Fever due to sepsis	20
" " mastitis	4
" " pneumonia	3
" " mastitis and sepsis	2
" " constipation	3
" " abscess of breast	1
" " pulmonary tuberculosis	1
" " eclampsia	1
" " unknown cause	7
Total	42 or 19.27%

Further, of the 42 cases of fever, 9 cases, or 21.42 per cent., were suffering from fever when first seen; 31, or 73.80 per cent., developed fever in the service of the Hospital; and 2, or 4.76 per cent., have no record of the temperature when first seen.

Of the 9, or 21.42 per cent., suffering from fever when first seen, the fever was due to:

	Cases.
Sepsis	4
Pneumonia	2
Unknown cause	2
Constipation	1
Total	9

Of the 31, or 73.80 per cent., that developed fever in the service of the Hospital, the fever was due to:

	Cases.		Cases.
Sepsis	15	Abscess of breast	1
Mastitis	4	Eclampsia	1
Sepsis and mastitis	2	Unknown cause	5
Constipation	2		
Phthisis	1	Total	31

Of the 2, or 4.76 per cent., that have no record of the temperature when first seen, the fever was due to:

Sepsis ..... 2 cases.

Résumé of Fever as a Complication in our 635 Cases of Untimely Interrupted Pregnancy.

Total number of fever cases in 635 cases of interrupted pregnancy, 108, or 17.01 per cent.

Total number with fever when first seen, 38, or 5.98 per cent.

Total number that developed fever in the service of the Hospital, 59, or 9.29 per cent.

Total number septic when first seen, 28, or 4.41 per cent.

Total number that developed sepsis in the service of the Hospital, 31, or 4.88 per cent.

Sepsis is, of course, the chief complication of interrupted pregnancy. Stumpf's[85] cases show a percentage of 10.7 of sepsis in those expectantly treated, 20 per cent. in those manually curetted. He uses the latter figure as a warning against the danger of interference, and remarks that "unfortunately, the hand of the practitioner in outdoor service is not above reproach." In spontaneous expulsion his percentage is 9.1 per cent.; in retention, 12.9 per cent.—figures which wring from him the remark that the unfortunate sequels, comparatively rare even with retention, are not nearly so frequent as the advocates of interference would make us believe. In our 242 cases of early abortion, 17 showed fever due to sepsis (7 per cent.), eight of which had fever when admitted. In 175 late abortions, 27, or 15 per cent., had symptoms of sepsis, and 16 of them were infected when first seen. Making the corrections, our percentages of sepsis in abortion cases are 3.7 per cent. and 6.8 per cent.; on all cases, 5.3 per cent.

The gravity of abortion as a menace to life is due largely to septic accidents. In Brion's[82] 530 cases, 18 deaths are recorded (3.39 per cent.). In the same period, in the same hospital, the mortality in normal delivery was but 0.8 per cent. These figures are not so eloquent as those of New York City records from 1884 to 1894, during which period the deaths directly due to "miscarriage" were equal to one-tenth of all deaths from puerperal diseases (see appended table).

Porak,[86] in 25 cases delivered artificially, had a mortality of 4 per cent.; in 301 allowed to take their course, one died, a mortality of 0.3 per cent.

Table Showing Population, Deaths from all Causes in Childbed, Deaths from Sepsis, and Deaths from Abortion and Premature Labor, New York City (1884–1894).

Year.	Estimated Population.	Deaths from Puerperal Diseases. (All Causes.)	Deaths from Sepsis.	Deaths from Abortion and Premature Labor.
1884....	1,356,522	438	240	34
1885....	1,396,079	394	213	40
1886....	1,436,789	371	186	37
1887....	1,478,686	355	198	43
1888....	1,521,805	442	246	41
1889....	1,566,181	393	226	47
1890....	1,611,851	383	208	45
1891....	1,658,853	420	249	48
1892....	1,707,226	417	277	30
1893....	1,757,009	384	237	39
1894....	1,808,244	358	193	47

"Sepsis" includes metritis, metroperitonitis, pyæmia, septicæmia, and puerperal fever. Abortion and premature labor ("miscarriage" in city records) include all labors before full term.

Aside from the question of sepsis, fever due to other causes complicates interrupted pregnancies, as is to be expected. It is a matter of common observation that a slight chill often follows curetting, particularly in septic cases. In our cases of early abortion, of 211 curetted, 8 developed a fever *post operationem*, whose average duration was three days; in 111 late abortions, 7 developed fever after scraping, which lasted on an average one and a half days. In 242 cases of early abortion we find:

	Cases.
Fever due to pulmonary tuberculosis	2
" " constipation	2
" " pneumonia	2
" " unknown cause	5

In 175 late abortions there was:

	Cases.
Fever due to constipation	5
" " bronchitis	1
" " mastitis	1
" " sepsis and mastitis	1
" " unknown cause	3

Rochet's[87] findings are different. He says that the temperature falls at once after curettage, even in cases in which sublimate injections and iodoform tamponade produced no effect.

4. *Parametritis.*

Rochet[87] regards parametritis as one of the most serious complications. Four of his 39 cases were so affected when operated on, and recovered slowly; one went on to suppuration. The curette removed putrid tissue in all four. Our tables show several such cases.

5. *Endometritis.*

There has been a warm controversy as to the occurrence of endometritis as a sequela. Hyperplastic endometritis has been under special discussion. Schroeder and Veit[101] say that it is impossible to tell whether the result of a retention will be a complete restitutio ad integrum or a thickened endometrium. Goldschmidt[88] first called attention to the latter possibility. Ruge[89] in eleven cases of hyperplastic endometritis, found a preceding abortion in four. Olshausen,[90] with more abundant material, came to the conclusion that an etiological connection between the two must be altogether denied. Bischoff,[91] Brennecke,[92] Dührssen,[93] Fritsch,[94] Henricius,[95] Martin,[96] and Küstner,[97] in opposition, lay stress on such a connection. The cases of Henricius and Küstner have this in common, that there was little or no interference during abortion. This fact gives their opinion weight, since one of the chief sources of error in examining cases of endometritis is the reliance which must be placed on the patient's statement as to previous occurrences. A decidua, also, firmly adherent to the uterine wall, may give to the examining finger the sensation of an empty uterus

when its presence may cause an endometritis. Puppe[98] examined 160 cases with the idea of throwing light on this subject. His examinations were all macroscopical, and, consequently, are of little value, in spite of his painstaking care.

6. *Tetanus.*

Tetanus has been reported as a sequel to abortion. Bennington collected 41 cases of puerperal tetanus, and of these two followed abortion. This serious complication is most often an accident in the course of a general septicæmia. We have no instance of tetanus to report among our 635 cases of interrupted pregnancies.

7. *Perforation of the Uterine Walls.*

Perforation of the uterine walls is a possible danger during curettage, especially if the sharp instrument be used, and hence some authors advise only the use of the dull or blunt instrument.[99]

In our 211 operations of instrumental curettage in early abortions, and 106 in late abortions, or 317 altogether, we have no perforation of the uterine wall to record, and in most of these cases the sharp as well as the dull curette was used.

As stated in another place, these operations were performed by a large number of different operators—one hundred for these operations would be a low estimate. It must be remembered, moreover, that in our service the sharp as well as the dull curette is used in almost every instance of curettage in the first two-thirds of gestation.

Our experience has taught us that the use of the blunt curette alone is insufficient, in cases of abortion, for the removal of the decidua, and was thus made use of in only a few of our earlier cases. In the majority both dull and sharp instruments were used.

The danger of perforation is reduced to a minimum if the curette, when introduced into the uterus, is made to pass cautiously to the fundus, and then a firm downward stroke is used to clear the uterine walls, especially at the horns.

8. *Mortality in the 635 Cases of the Untimely Interruption of Pregnancy.*

Mortality in Early Abortion.—We have to report among our 242 early abortions no deaths from any cause.

During the time the Hospital physicians were in attendance upon these cases, none of them were transferred to other institutions, and, as far as we have been able to ascertain, none of these 242 cases entered hospitals for treatment subsequent to our attendance.

As we show in another place, the average duration of treatment of these early abortions was seven days and eight hours. By reference to the statistical synopsis of these cases, it will be seen that a few cases either refused treatment or called in private physicians or midwives in the first few days of the puerperium, and, consequently, were discharged at that time from the service of the Hospital.

We have endeavored, during a period of from one to four years after the abortions in our 242 cases, to find the patients and ascertain from them the subsequent histories regarding the late sequelæ of abortion, and the

influence of various modes of treatment upon subsequent menstruation and child-bearing (sterility).

As our tables indicate, we were able to find actually 76 of the total 242 cases and examine them regarding the above points of interest. (See Prognosis and Sequelæ.)

Mortality in Late Abortions.—In the treatment of the 175 late abortions, the average duration of attendance was seven days and twenty-one hours.

As in the case of early abortions, as will be seen by reference to the statistical analysis, a very small proportion were discharged in the early days of the puerperium because of the patients refusing treatment, or calling in private physicians or midwives.

We have one death to report among the 175 late abortions. The following is an abstract of the case:

C. N. 1,198.—Russian; age 36; VI. para; sixth month of gestation; no record of previous interrupted pregnancies; symptoms of hæmorrhage had continued twelve hours when first seen by the Hospital physician; before being seen by the latter, two private physicians in attendance; placenta prævia; severe antepartum hæmorrhage; dilatation with Barnes's bags; rupture of the uterus; podalic version; still-born child; placenta manually extracted by the Hospital physician; duration of the third stage, five minutes; death, thirty-six hours postpartum, of shock.

Five of the 175 cases of late abortion were for various reasons transferred to some other hospital at different periods of the puerperium. Two of these were homeless and friendless; one was suffering from chronic pulmonary tuberculosis; one from chronic pulmonary tuberculosis and endocarditis; one from endocarditis, and one from parametritis. We append abstracts of these cases.

1. C. N. 1,468.—Russian; age 36; V. para; fifth month of gestation; child born before arrival of Hospital official; symptoms had continued two days when the patient was first seen; child still-born; placenta broken up in delivery; antepartum hæmorrhage; instrumental curettage and intrauterine douche; no fever; patient transferred to Gouverneur Hospital March 3, 1892. No record of the patient can be found on the hospital books; she entered the institution under an assumed name.

2. C. N. 1,785.—Roumanian; age 24; III. para; fourth month of gestation; unattended by Hospital official; symptoms had continued one day when seen; child still-born; placenta broken up; antepartum hæmorrhage moderate; temperature 103 degrees Fahrenheit when seen; 103 degrees Fahrenheit after operation; digital and instrumental curettage; transferred to Gouverneur Hospital on the second day of the puerperium with symptoms of parametritis; records at Gouverneur Hospital state that the patient was treated there three days for "pelvic cellulitis" and discharged "cured."

3. C. N. 3,985.—Russian; age 19; I. para; fifth month of gestation; unattended by Hospital official; symptoms of hæmorrhage had continued twelve hours when first seen; child still-born; placenta spontaneously delivered; membranes intact; vaginal douche the only treatment; no fever;

homeless and friendless; went to some hospital on the third day of the puerperium; unable to trace the patient.

4. C. N. 5,219.—Russian; age 21; I. para; fourth month of gestation; attended by the Hospital official; child still-born; placenta broken up; moderate antepartum hæmorrhage; temperature 100.6 degrees when first seen; highest temperature, 100.6 degrees; first day, day of highest temperature; total duration of fever, a few hours; operation at once; instrumental curettage, uterine douche; fever due to sepsis; discharged seventh day in poor condition; seen two weeks later with parametritis; sent to Gouverneur Hospital December 17, 1893; discharged from that hospital December 31, 1893, suffering from mild endometritis.

5. C. N. 7,679.—American; age 30; V. para; third and a half month of gestation; symptoms present four days when seen; placenta broken up; moderate antepartum hæmorrhage; six hours between first visit and operation; temperature 101.2 degrees Fahrenheit when first seen, 101.2 degrees after operation, 102.8 degrees on second day; fever lasted fourteen days; instrumental curettage and uterine douche; discharged fifteenth day in bad condition, to be transferred to St. Francis Hospital; sepsis and pericarditis. The patient entered the hospital under another name and was lost sight of.

Mortality in Spontaneous Premature Labors.

Among the 175 spontaneous premature labors there were four deaths. Three of these occurred in the service of our Hospital, and the causes of death were (1) shock and hæmorrhage from a placenta prævia, (2) broncho-pneumonia, and (3) eclampsia. Another patient died on the second day of the puerperium, twenty-four hours after the case had been turned over to a private physician.

We have thus three deaths among the 175 cases in our own service, and four if we include the case which subsequently terminated fatally.

As far as we have been able to trace our cases after their confinements, the above include all the fatal cases.

Six other cases were transferred, for various reasons, to other institutions, and as far as we have been able to follow these six cases there were no fatal terminations.

The following is a synopsis of the four cases in which death followed a spontaneous premature delivery:

1. C. N. 349.—Dutch; age 34; II. para; ninth and a half month of gestation; confined by the Hospital official; first seen in the first stage of labor; child lived three days; placenta prævia; podalic version; manual extraction of the placenta; third stage lasted thirty-five minutes; death on third day of hæmorrhage and shock.

2. C. N. 1,723.—American; age 38; VI. para; ninth and a half month of gestation; confined by the Hospital official; first seen in the first stage of labor; child lived two days; placenta expressed; third stage lasted thirty minutes; prolapse of hand; no record of fever when seen; later temperature 106.2 degrees; death on seventh day, of broncho-pneumonia.

3. C. N. 6,925.—American; age 31; VIII. para; ninth month of gestation; two previous premature labors; unattended by Hospital official; still-

born child; placenta expressed; third stage lasted thirty minutes; albuminuria; private physician took charge of case on first day of the puerperium; it was learned that the patient died twenty-four hours later, of nephritis.

4. C. N. 7,070.—Russian; age 26; II. para; ninth and a half month of gestation; confined by the Hospital official; first seen in first stage of labor; child lived only a few minutes; placenta expressed; third stage lasted five minutes; eclampsia; manual dilatation and incision of the cervix; podalic version and extraction; death from eclampsia, on second day.

Six of our cases of spontaneous premature delivery were, for various reasons, transferred to some other hospital. One was delivered of a macerated fœtus while undergoing the usual antepartum examination in the present sub-station building of the Hospital; she was homeless and friendless. The remaining five were transferred to other institutions because it was judged that their condition demanded routine hospital treatment which could not be properly carried out in the tenement houses. We append below an abstract of these six cases:

1. C. N. 150.—German; age 30; I. para; ninth month of gestation; child lived one day; profuse postpartum hæmorrhage; temperature 101.2 degrees when first seen; highest temperature 101.2 degrees, on second day; fever lasted thirty days; instrumental curettage; sepsis; sent to Bellevue Hospital on twenty-eighth day of puerperium; there she remained three weeks, and was discharged entirely cured.

2. C. N. 189.—American; age 22; II. para; seventh month of gestation; one previous abortion; confined by Hospital official; first seen in first stage of labor; child lived five hours; placenta spontaneously delivered; antepartum hæmorrhage; albuminuria; discharged on eleventh day in bad condition and transferred to Bellevue Hospital.

3. C. N. 657.—Russian; age 23; V. para; eighth month of gestation; confined by Hospital official; first seen in first stage of labor; child lived three days; placenta expressed; third stage lasted five minutes; highest temperature 101.3 degrees, on third day; duration of fever a few hours; albuminuria; mastitis; extreme œdema and ascites at labor; discharged on tenth day in bad condition; transferred to Bellevue Hospital, where the patient remained only a few days.

4. C. N. 3,690.—American; age 27; II. para; eighth month of gestation; confined by Hospital official; first seen in second stage; macerated child; placenta expressed; third stage lasted twenty minutes; no fever; confined on examining table of the Hospital; transferred immediately to Gouverneur Hospital, which she entered March 24, 1893, and was discharged March 28, 1893, in good condition.

5. C. N. 5,945.—Russian; age 25; III. para; seventh month of gestation; one previous premature labor; confined by Hospital official; first seen in second stage; child lived one day; placenta spontaneously delivered; duration of third stage ten minutes; temperature 103 degrees on third day. Fever; pulmonary tuberculosis; discharged on ninth day in bad condition; sent to Gouverneur Hospital April 17, 1894. Patient cannot be traced, as she entered under an assumed name.

6. C. N. 6,128.—Russian; age 20; I. para; ninth month of gestation; confined by Hospital official; first seen in first stage; child lived one day; placenta expressed; third stage lasted fifteen minutes; temperature 104 degrees when first seen; treated for two weeks prior to labor by private physician for fever, headache, and diarrhœa (typhoid); transferred to Bellevue Hospital on the third day of the puerperium. Admitted to Bellevue May 6, 1894; treated there for typhoid fever; discharged cured, May 30, 1894.

Résumé of the Mortality in our 635 Cases of Untimely Interrupted Pregnancy.

Mortality in 242 cases of early abortion, 0 per cent.

Mortality in 175 cases of late abortion, one case, or 0.57 per cent. Cause of death was placenta prævia and rupture of the uterus.

Mortality in 218 cases of spontaneous premature labor, three cases, or 1.37 per cent. Causes of death were (1) placenta prævia, hæmorrhage, and shock; (2) broncho-pneumonia; (3) eclampsia.

Total Mortality in the 635 Cases of Interrupted Pregnancy, 0.63 per cent.

Summing up, we find as sequels or complications of interrupted pregnancy, first, and most important, sepsis in all its forms—metritis, parametritis, endometritis, septicæmia, pyæmia, fever; intercurrent disease giving rise to fever, *e.g.*, tuberculosis, retention of placenta and decidua with consequent hyperplastic endometritis, subinvolution, etc.; hæmorrhage leading often to sepsis; tetanus; death as a result of one or more of these complications.

Prognosis, according to Lepage,[100] varies according to:

(1) The period of gestation, the danger of being less toward the third or fourth month.

(2) Retention of placenta and membranes.

(3) Treatment.

All these may be condensed into one word, *treatment;* and we have altogether failed in this laborious undertaking if we have not made clear and unmistakable our interpretation of the meaning of that word.

Sequelæ.

1. *Sterility.*

Oldhausen's school, Stumpf[3] says, in particular, deserves what credit there is in having "reduced to their proper level the fears of the evil results to be anticipated from the retention of membranes" in premature labor. Winter[102] says the puerperium is not disturbed by retention, and the mucous membrane regains its functional activity in a short time. His point of view is purely clinical. In 38 per cent. of his cases with partial or complete retention, pregnancy ensued early, while after removal of the vera, conception occurred in 6.29 per cent. only. Puppe,[98] who published these results, concludes from these figures that a uterine mucous membrane completely renewed after abortion is less capable of playing the part of a decidua of pregnancy than one which has done so before in whole or in part. One hundred cases were carefully kept under observation by him before, during, and for some time after abortion. The

menses returned usually in four weeks in all cases. Puppe carefully separated the healthy women from those previously diseased, but it does not appear that he had seen the fruit of conception when it occurred. In other words, he does not state that the child was carried to term. Moreover, he divides his cases into two groups: (1) cases running their course with retention, and (2) those in which the entire vera was removed, and draws his conclusions when he confesses himself unable to state that the removal is ever complete. Durlius, on the other hand, mentions sixty cases of conception following curettage.

Certainly, our figures lead one to a far different conclusion from Puppe's. Of 119 cases treated instrumentally, 38, or 31.9 per cent., had experienced one or more previous interrupted pregnancies; 5, or 4.2 per cent., suffered subsequently in the same way; 48, or 40.3 per cent., gave birth to living children at term; and 21, or 17.6 per cent., were found to be pregnant from the fourth to the eighth month when visited. *These observations were made at the patients' homes and the children seen.* Of 28 cases of abortion expectantly treated, 10, or 35.7 per cent., had had similar previous experiences. *None* suffered from subsequent interrupted pregnancies; 7 gave birth to living children at term afterward (25 per cent.); 5, or 17.8 per cent., were found to be pregnant from the fourth to the eighth month when visited. It is interesting to tabulate these results for comparison, in spite of the disparity in the number of cases. (It should be borne in mind that these women were found with great difficulty, thus accounting for the comparatively small number of returns.)

Treatment.	Subsequent Interrupted Pregnancy.	Full-term Pregnancy.	Pregnant 4th to 8th Month.
Expectant cases	0.0%	25.0%	17.8%
Instrumental cases.....	4.2%	40.3%	17.6%

(See Tables of Results in Early and Late Abortions.)

The points in which the instrumental treatment suffers by comparison is in the percentage of subsequent interrupted pregnancies, and also in the fact that 31.9 per cent. of the instrumental as against 35.7 per cent. of expectant cases had previously aborted. One case digitally curetted gave birth to two children afterward.

Dührssen[93] believes that the retention of a part of the decidua is the rule, and that this retention is ominous, on account of hæmorrhage or sepsis. Stumpf[85] denied this assertion, says it cannot be proved clinically or anatomically, and claims that it is disproved by the observations of Winter[102] and Puppe,[98] and also by Klein,[103] who concludes from his studies on involution that the vera is transformed *in loco* to mucous membrane in from four to six weeks. We refer the reader to the section on Pathology for a demonstration of the fact that Dührssen is correct in the stand he takes.

2. *Endometritis and Operative Interference.*

As regards endometritis, diametrically opposite opinions are again maintained. Stumpf, Winter, and Puppe say that it is not the result of abortion and retention of membranes, and point to Veit's [101] curetted cases, in which the endometritis had to be treated after the puerperium was ended. They neglect to suggest the possibility of a prior abortion expectantly treated being at the bottom of the trouble. Reference to the table given above (page 175) shows a 15.3 greater percentage of subsequent pregnancies when the secundines were instrumentally removed, which is tolerably fair evidence, at least, that these cases were free from endometritis.

We also attempted to learn and compare the character and duration of the lochial discharge, the character, time, and duration of the first menstruation following the abortion, in cases allowed to run their course with retention of the vera (expectant treatment), and in those in which the entire vera was removed at the time of the abortion (curettage).

Our observations in the 148 cases of abortions (76 early and 72 late) were mainly dependent upon the statements of the patients, and for this reason we have considered them too doubtful and unreliable to use, and have consequently abandoned them as useless. On the other hand, as already stated, our observations upon the subsequent labors at term and subsequent pregnancies are exact, because, in each of the 148 cases reported upon, the women and their children were *seen*.

We append in the foot-note Puppe's observations.*

*G. Puppe: Inaugural Dissertation, Berlin, 1890.

Turning now to the real object of the examination, namely, the consideration of the sequelæ after abortion, we shall find that the material before us can be readily divided into two groups corresponding to the starting point of the investigations: (1) *cases running their course with retention of the vera;* (2) *those in which the entire vera was removed during the abortion.* Regarding the course of the abortion, the latter group is again divisible into those cases in which the entire ovum was spontaneously expelled, and those in which the removal of the entire vera required interference, though it be only a manual one.

Of the 100 cases here under consideration, ten belong to the first group, those which have run their course without any medical interference; but of these we must exclude the larger half (seven), because they complained before the abortion of symptoms which rendered disease of the uterus almost certain (chiefly endometritis). The exclusion is the more obvious, as our main object is to study the sequelæ of abortion in healthy women. For the same reason it is absolutely necessary to make a like separation in the other groups made in this treatise. A separate section will be devoted to the sequelæ after abortion in women previously diseased.

In general the ova derived from this entire group, six of which were of the third month and four of the second, were nearly throughout fine specimens, as I must not fail to emphasize here. The ovisacs were intact, frequently with recently dead, rarely with partly absorbed, fœtuses; the chorion was, as a rule, surrounded with the uninjured reflexa; the decidua, as is self-evident from the age of the ova, not adherent together, the transition folds clearly pronounced. As stated above, treatment in all these cases had been made unnecessary by the spontaneous course; by the time the polyclinical attendant reached the bedside the ova were in part delivered into the vagina, when the internal os was always found closed; in part they were handed to the attendant on his arrival, as already fully delivered.

The several points to which the later examination had to be directed are the state of the *lochial discharge*, the condition of the first and the subsequent menses. First, as regards the lochial discharge, it lasted in two of the cases eight days, in the third the length of time is given as six weeks, up to the time of the first menses. The former two statements appear normal, but the latter surprised us, all the more because the further symptoms in this patient (even conception occurring after five recurrences of a normal menstruation) pointed to a healthy condition of the uterus. An explanation of the fact might perhaps be found in the normal mode of detachment of the decidua vera from the uterine wall as described by Dührssen. According to this observer the region of separation of the vera is not in its superficial, but in the deeper ampullary glandular layer. If we assume in our case a separation at first only in the superficial region, then it was the object of the lochial discharge to complete it; that is to say, to eliminate the decidual elements as far as the deeper layer—a task which could not be completed within the normal duration of the lochia. Whether this explanation is true cannot be ascertained, since no microscopical examination was made of the expelled vera; at any rate it is probable.

As stated before, in this case the first menses occurred after the termination of the lochia, *i.e.*, in six weeks ; in the other two cases, after five and four weeks respectively ; in all cases it was rather profuse without being painful, lasting three to five days. The profuseness of the first catamenia is counterbalanced by the relative scantiness of the next, a fact positively asserted by all the three patients. The succession of the several menstruations was in two cases regular, at four weeks' interval (in one, see above, *conception soon occurred*) ; in the third case, which was complicated with chlorosis, it was irregular, the interval being once five weeks, several times three weeks.

Next to this group of cases with spontaneous course comes another which was terminated manually only, in which the entire vera was removed from the uterus. The number of cases belonging under this head is 14 ; again we must exclude 8 cases as diseased previous to the abortion. Of the remaining 6 cases, 2 were of the second, 3 of the third, and 1 of the fourth month. In these cases the lochial discharge was absolutely normal ; as a rule it lasted eight days, only once the duration is given, as in the former group, until the first catamenia. The first menses occurred four times after four, once after five, and once after six weeks ; in the great majority it was profuse and normal in duration. The further course of the menses was also normal; four weeks are uniformly stated as the interval. No conception is to be noted in this group.

In endeavoring to draw a conclusion from all these abortions unquestionably terminated by the expulsion of the entire vera, we are struck in the first place by the large number of sick patients (15) in comparison with those not sick (9); all the more because in every case the vera was detached spontaneously or by a purely manual interference (hence without any great difficulty). In the majority of cases the deciduæ are marked in my list as "thickened." If they form, as the history shows beyond a doubt, the main constituent of an inflamed endometrium, the fact here observed deserved mention in view of the circumstance also noted by Veit, among others, "that when it undergoes inflammatory thickening it becomes more firmly adherent to the uterus." The large proportion of the sick to the well (5 to 3), in all of whom the vera was detached spontaneously or with slight exertion, is, at all events, very remarkable.

The period of involution was apparently normal in all cases ; the duration of the lochia, its quality, the absence of hæmorrhages, and the later well-being of the patients indicate it. The first-named period is almost uniformly given as eight days; the two statements, which differ, can probably be sufficiently explained : the quality of the lochia corresponds to the symptoms known from the puerperium, but the bloody lochia here seem to be of much slighter importance. The statements made to me are, as a rule, that the lochial discharge had been at first bloody, had gradually become

lighter, and finally whitish. Putrescence was denied in all cases ; only a stale odor was admitted. The quantity, too, was almost regularly slight ; the question whether hæmorrhages had taken place, or coagula passed, was always denied.

The condition of the first menstruation is remarkable in so far as all the women called it profuse. That this statement is correct can hardly be doubted, although occasionally the statements of a single person are not always as reliable as might be desired, despite the most careful questioning; yet when the reports are almost unanimous, doubt would scarcely be in place. Still the fact *per se* is remarkable enough. When under other conditions the genitals are subject to periodical engorgements of blood which find expression in menstruation, it seems strange that, after the genitals have just discharged a considerable quantity of blood, a profuse menstrual hæmorrhage again occurs in four to at most six weeks. This phenomenon, however, finds its analogue in the profuseness of the first catamenia usually observed after delivery.

The *time of the return of the first menses* was in the majority of cases (5) four weeks ; in 2, five weeks ; and in 2, six weeks. The duration of the courses ranged between three and eight days ; they were never painful.

Regarding the *second and the later menses, the statements* obtained are normal ; a type of four weeks exists throughout, with relative scantiness—a fact which deserved to be specially emphasized in view of the profuseness of the preceding one. The above-described single instance of conception occurring appears unsuitable for making remarks about the regaining of the power of conception in this connection. A better opportunity will present hereafter.

Next in order after the abortions terminated by the positive removal of the entire vera, it will be best to consider the group treated with the curette. In these cases, likewise, we might assert that the entire vera was removed by the curette, since this was the object of the interference ; but I prefer to treat of the curetted cases in a group by themselves. My motive in making this separation was this : I have above expressed my intention to separate the available cases into those of total removal of the vera, and total or partial retention of the vera, since what was handed to me as actually expelled was a voucher for the correctness of the relations named. In the cases treated by curettage, however, it is a different matter. While it is most probable that the thorough use of the curette has removed all of the vera, we cannot be quite sure that a smaller or larger piece of vera was not left adherent somewhere.

For the reason stated, we cannot assign the same reliability to the conclusions drawn from the sequelæ after abortion in this group as in the remaining cases ; but I may restrict myself to the enumeration of the most important points for this group. First, as regards the indication for the curettage in these cases, it may be said that it was found mainly in the presence of very firmly adherent shreds of vera which resisted manual treatment.

The number of curetted cases was 14, from which we must exclude 7 as previously diseased. The remaining 7 differed from the former by a rather long duration of the lochial discharge in the majority of cases. In 2 the lochia continued until the first menstruation after the abortion, and in 2 others they lasted two weeks. This fact might lend color to the above-mentioned possibility that the curette had left ample cause for the activity of the lochia. Two more patients state the duration of the lochia as ten and eight days respectively ; the seventh claims not to have noticed them at all. The quality of the lochia was normal throughout ; the passage of coagula, portions of the decidua, or perhaps a hæmorrhage, had never been observed.

All women menstruated first four weeks after abortion, and they too unanimously reported that the menses were profuse ; the duration ranged between two and eight days. According to the patients they were uniformly painless. The subsequent catamenia appeared in all women after four weeks' interval, always scantier than the first, but normal. Conception had not occurred in any of the patients at the time of the last examination.

PREVIOUS PREMATURE INTERRUPTIONS OF PREGNANCY, TREATMENT, AND SUBSEQUENT LABORS AT TERM IN 76 CASES OF EARLY ABORTIONS.

Para.	C. N.	Previous Interrupted Pregnancy.	Date of the Abortion.	Treatment.	Subsequent Interrupted Pregnancy.	Subsequent Labors at Term.
I.	59	1 abortion	June 21, 1890	Instrumental curettage.		2 children.
VII.	108		Sept. 3, 1890	" "	None	2 : February, 1892 ; August, 1893.
V.	115	1 premature	Sept. 3, 1890	" "		1 child.
X.	117		Sept. 16, 1890	" "		1 child, January, 1893.
I.	405		May 11, 1891	Expectant		2 children.
VIII.	437	2 premature	May 24, 1891	Instrumental curettage.		
I.	442		May 26, 1891			
II.	754		Sept. 17, 1891	" "	One at 3d month	1 child, November 6, 1892.
IV.	834	1 abortion	Sept. 17, 1891	" "		
VI.	1,083	2 abortions	Dec. 15, 1891	Dig. and inst. curettage		1 child since.
V.	1,091	1 abortion	Dec. 17, 1891	Instrumental curettage.		2 children.
VI.	1,153	1 abortion and 1 premature	Dec. 31, 1891	Dig. and inst. curettage		1 child 1½ years old.
X.	1,213	3 premature	Jan. 11, 1892	" " "		September, 1893 ; boy, 2 months.
.....	1,337		Feb. 6, 1892	Instrumental curettage.		
VII.	1,994	1 premature	June 13, 1892	" "		2 children : June, 1893 ; Aug., 1894.
IV.	2,103		June 30, 1892	" "		1 child, September, 1893.
X.	2,270	6 premature	July 30, 1892	" "		
III.	2,275		July 30, 1892	Dig. and inst. curettage		
VII.	2,327	1 premature	Aug. 9, 1892	Instrumental curettage.		Twins, Oct., 1893 ; again pregnant.
III.	2,455		Aug. 30, 1892	" "		2 children since.
.....	2,476		Aug. 31, 1892	" "		1 child ; again pregnant.
VI.	3,075		Dec. 8, 1892	Dig. and inst. curettage		1 child, January, 1894.
IV.	3,159	1 premature	Dec. 22, 1892	" " "		1 child, November, 1893.
IV.	3,520	1 premature	Feb. 24, 1893	Instrumental curettage.		1 child, January, 1894.
V.	3,720		Mar. 29, 1893	" "		1 child 6 months old.
II.	3,786		April 12, 1893	" "		1 child 4 months old.
VII.	3,821	1 abortion	April 17, 1893	Dig. and inst. curettage		
I.	3,986		May 16, 1893	" " "		
V.	4,127		June 13, 1893	Instrumental curettage.		
V.	4,128		June 13, 1893	" "		1 child 4 weeks old.
II.	4,161		June 18, 1893	Dig. and inst. curettage		1 child, August, 1894.
II.	4,165		June 18, 1893	" " "		Pregnant 7 months.
II.	4,173		June 19, 1893	Instrumental curettage.		Pregnant 7 months.
V.	4,249		July 3, 1893	" "		Child few weeks old.
VI.	4,265		July 5, 1893	Dig. and inst. curettage		Child few weeks old.
I.	4,283		July 8, 1893	" " "		Pregnant 4 months.
V.	4,330		July 15, 1893	" " "		Pregnant 8 months.
IV.	4,356		July 18, 1893	Instrumental curettage.		Child 2 months old.

Early Abortions.—(Continued.)

Para.	C. N.	Previous Interrupted Pregnancy.	Date of the Abortion.	Treatment.	Subsequent Interrupted Pregnancy.	Subsequent Labors at Term.
III.	4,450	..	Aug. 1, 1893	Instrumental curettage.		Pregnant 8 months.
I.	4,466		Aug. 5, 1893	" "		Has a child.
V.	4,502		Aug. 10, 1893	" "		
II.	4,547		Aug. 17, 1893	Dig. and inst. curettage		
II.	4,572		Aug. 2, 1893	Instrumental curettage.		Child 2 months old.
VIII.	4,685	2 premature	Sept. 2, 1893	" "		Pregnant 4 months.
I.	4,767		Sept. 17, 1893	" "		Pregnant 8 months.
X.	4,852		Sept. 26, 1893	" "		Pregnant 9 months.
VI.	4,855	1 premature	Sept. 27, 1893	" "		Child, December, 1894.
V.	4,909		Oct. 6, 1893	Dig. and inst. curettage		
III.	4,949		Oct. 11, 1893	" " "		
III.	5,111		Nov. 2, 1893	" " "		Pregnant 8 months.
V.	5,151		Nov. 5, 1893	" " "		Pregnant 7 months.
VIII.	5,199	2 premature	Nov. 12, 1893	" " "		
III.	5,207	1 premature	Nov. 13, 1893	" " "		Pregnant 9 months.
IV.	5,310		Nov. 25, 1893	Instrumental curettage.		Pregnant 8 months.
IV.	5,327		Nov. 27, 1893	" "		Pregnant 7 months.
II.	5,360			" "		Has child 6 months old.
XII.	5,375	1 premature	Dec. 4, 1893	" "		
V.	5,387		Dec. 6, 1893	" "		
VI.	5,451		Dec. 16, 1893	" "		Pregnant 7 months.
X.	5,457	2 abortions and 1 premature.	Dec. 16, 1893	" "		
IV.	5,500			" "		
II.	5,511	1 premature	Dec. 25 1893	" "		
I.	5,559		Jan. 3, 1894	" "		
IX.	5,570		Jan. 4, 1894	" "		
IX.	5,620	1 premature	Jan. 14, 1894	" "		
I.	5,628		Jan. 17, 1894	" "		
V.	5,732	1 premature	Feb. 18, 1894	" "		
I.	5,781	1 premature	Mar. 1, 1894	" "		Pregnant 7 months.
IV.	5,869	1 premature	Mar. 22, 1894	" "		Pregnant 3 months.
II.	5,989		May 31, 1894	" "		1 child since.
V.	6,354	1 premature	June 9, 1894	" "		
I.	6,492		June 26, 1894	" "		
III.	6,897	1 premature	Aug. 20, 1894			
II.	7,177	..	Aug. 22, 1894	" "		August, 1895.
II.	7,535		Nov. 28, 1894	" "	One at 5th month	1 child.
.....	7,738	1 premature	Jan. 9, 1894			1 child.

PREVIOUS PREMATURE INTERRUPTIONS OF PREGNANCY, TREATMENT, AND SUBSEQUENT LABORS AT TERM IN 72 CASES OF LATE ABORTIONS.

Para.	C. N.	Previous Interrupted Pregnancy.	Date of the Abortion.	Treatment.	Subsequent Interrupted Pregnancy.	Subsequent Labors at Term.
.....	8	Moved away.				
V.	60	.....	June 2, 1890	Curette	.....	2 children since: May, '91; Jan., '93.
XI.	215	.....	Jan. 11, 1891	Dull curette	2 miscar., Mar. & July, '94.	
V.	283	.....	Mar. 4, 1891	" "	.....	2 children: Aug., 1892; Feb., 1894.
X.	339	.....	April 4, 1891			
VIII.	466	.....	June 6, 1891	Instrumental curettage.	.....	1 child, October, 1893.
IV.	493	.....	June 22, 1891	.....	.....	2 children: Jan., 1892; April, 1894.
II.	567	.....	July 24, 1891	.....	.....	2 children: Aug., 1892; Feb., 1894.
II.	612	1 abortion	Aug. 12, 1891	Instrumental curettage.		
IV.	871	2 abortions	Oct. 19, 1891	" "	.....	No children; left husband.
II.	888	.....	Oct. 10, 1891	" "	.....	1 child, May, 1892.
II.	1,055	....	Dec. 9, 1891	Dig. and inst. curettage.	.....	1 child, June, 1893; again pregnant
.....	1,267	.....	Jan. 22, 1892	.....	.....	2 children: Nov., 1892; June, 1894.
VIII.	1,303	.....	Jan. 29, 1892	Instrumental curettage.	.....	1 child, September, 1893.
IV.	1,352	.....	Feb. 9, 1892	" "	.....	1 child.
VI.	1,355	.....	Feb. 10, 1892	.....	.....	1 child, January, 1893.
III.	1,381	.....	Feb. 16, 1892	Digital curettage	.....	2 children: Jan., 1893; Dec., 1893.
VIII.	1,439	.....	Feb. 27, 1892	Instrumental curettage.		
V.	1,468	.....	Mar. 3, 1892	" "	....	1 child, February, 1893.
III.	1,686	.....	April 12, 1892	" "	.....	1 child 1½ years old.
III.	1,785	.....	April 30, 1892	Dig. and inst. curettage.	.....	1 child, May, 1893.
I.	2,922	.....	May 29, 1892	.....	.....	2 children: May, 1893; June, 1894.
I.	1,192	....	July 16, 1892	Digital curettage	.....	1 child, Jan., 1893; again pregnant.
VII.	2,262	2 premature	July 28, 1892	Dig. and inst. curettage.		
II.	2,390	.....	Aug. 19, 1892			
VI.	2,930	.....	Nov. 13, 1892	Instrumental curettage.	.....	1 child, January, 1894.
V.	3,004	3 premature	Nov. 27, 1892	" "	Nov., '92, had third miscar.	
X.	3,112	3 premature	Dec. 12, 1892	.....	.....	Pregnant 7 months.
VIII.	3,475	3 premature	Feb. 16, 1893	Instrumental curettage.	.....	1 child 6 months old.
.....	3,485	....	Feb. 18, 1893	" "	.....	1 child 6 months old.
XII.	3,553	5 premature	Feb. 28, 1893	" "	.....	Pregnant 5 months.
V.	3,954	.....	May 10, 1893	" "	.....	1 child 3 months old.
III.	3,974	1 premature	May 13, 1893	Dig. and inst. curettage.	.....	1 child, May, 1894.
VI.	4,102	.....	June 8, 1893	Instrumental curettage.		
VIII.	4,107	....	June 9, 1893	" "		
I.	4,242	.....	July 2, 1893	.....	.....	Pregnant 8 months.

Late Abortions.—(Continued.)

Para.	C. N.	Previous Interrupted Pregnancy.	Date of the Abortion.	Treatment.	Subsequent Interrupted Pregnancy.	Subsequent Labors at Term.
VIII.	4,309		July 11, 1893	Dig. and inst. curettage.		
IV.	4,597	2 premature	Aug. 25, 1893			
IV.	4,672		Sept. 6, 1893			
II.	4,774		Sept. 9, 1893	" " "		
VIII.	4,824	6 abortions	Sept. 23, 1893	Instrumental curettage.		
X.	4,906		Oct. 5, 1893	" "		
IV.	4,910	1 abortion	Oct. 6, 1893	" "		
II.	4,919	1 abortion	Oct. 7, 1893	" "		
V.	5,042	1 abortion	Oct. 20, 1893			
.....	5,044		Oct. 24, 1893	Dig. and inst. curettage.		
IV.	5,051		Oct. 25, 1893	Instrumental curettage.		
III.	5,242		Nov. 7, 1893			
III.	5,286	1 premature	Nov. 23, 1893			Pregnant 6 months.
VII.	5,298		Nov. 24, 1893			
III.	5,318		Nov. 26, 1893			
VIII.	5,388	1 premature	Dec. 6, 1893			
I.	5,463		Dec. 17, 1893	Instrumental curettage.		Pregnant 5 months.
.....	5,575	1 premature	Jan. 5, 1894	" "		Pregnant 3 months.
V.	5,635		Jan. 19, 1894	Dig. and inst. curettage.		Pregnant 4 months.
III.	5,647		Jan. 22, 1894	Instrumental curettage.		Pregnant 6 months.
III.	5,656	2 premature	Jan. 24, 1894	" "		
II.	5,685		Feb. 2, 1894	" "		
I.	5,737		Feb. 18, 1894	" "		
.....	5,769		Feb. 26, 1894			Pregnant 4 months.
.....	5,792		Mar. 3, 1894	Instrumental curettage.		
VI.	5,880		Mar. 25, 1894	" "		
IV.	6,915		Aug. 21, 1894	Dig. and inst. curettage.		August, 1895.
VIII.	7,199		Sept. 24, 1894			
VI.	7,260		Oct. 5, 1894			
IV.	7,406		Oct. 30, 1894	Instrumental curettage.		January, 1895.
.....	7,465		Nov. 14, 1894	" "		
IV.	7,632	1 abortion and 4 premature	Dec. 23, 1894			
III.	7,683		Dec. 31, 1894	" "		
.....	7,751		Jan. 2, 1895	" "		January, 1896.
III.	7,907		Feb. 17, 1895			
XI.	8,023	1 abortion and 1 premature	Mar. 20, 1895			Pregnant 5 months.

Treatment.

Turning to the treatment of such cases as form the subject of this paper, it is well to review other work in the same line and to show how weight of opinion, notably German, turns the balance in favor of the active treatment we advocate. Curettage is not new. Récamier used it in Austria in 1846; Boetus[104] advocated it in 1877. Opinions differ widely, as might be expected, not only as regards indications for and the method of using it, but as to its expediency in any case. Czobos[105] advised expectant treatment alone, setting aside the curette on the ground that active interference is apt to produce septic absorption. His preference is for the tampon and ergotin. E. Schwarz[106] uses manual dilatation and curetting if the ovum is intact, instrumental procedure in case it is not. From these opinions it is possible to pass by easy stages to the radical and uncompromising stand of Weekbecker-Sternfeld[107] and Dührssen,[108] who condemn temporizing in any form. The latter is our position also.

All methods for the management of abortion may be systematically classified as follows:

1. Purely conservative or expectant treatment. Interference is altogether interdicted, and the sole reliance placed upon the tampon, vaginal irrigation, and ergot.

2. Early artificial removal of the decidua or placenta—active treatment, so called—in which curettage is the routine plan.

3. An intermediate or eclectic method, in which intervention is resorted to only in order to control hæmorrhage or sepsis.

Each of these methods, as remarked, finds its able advocates. Winckel,[109] Stumpf,[110] and Zweifel[111] are notably among the endorsers of the first plan. Among those who favor an active intervention in all cases of abortion, at least those falling within the first four months of gestation, are Dührssen,[108] Auvard,[112] Borel,[142] von Brehm,[113] A. Martin, Prochownik,[114] Weekbecker-Sternfeld,[107] Spöndly,[115] and Völtz.[116] In the last group, among those who take an intermediate stand, we find Charles,[117] Porak,[118] and Audebert.[119] The work will be reviewed in accordance with this classification and in chronological order, selection being made from the enormous mass of literature bearing on the subject.

Czobos (1884) has already been referred to as an advocate of expectant treatment. Winckel,[120] at the first meeting of the Association of Upper Bavarian Physicians, pronounced himself in favor of the most conservative treatment of abortion and immature labor, as opposed to the spreading tendency in favor of active interference. Stumpf supported Winckel at this time, and later published an elaborate tabulated statement of 446 cases from the obstetrical polyclinic at Munich.[121] One hundred and sixty-nine cases of abortion were treated on the purely expectant plan, by tampon and ergot, and 84 per cent. ran a favorable course. The number of cases without complication in which retention of membranes was noted, was slightly less than of those in which the ovum was described as having been

expelled intact. The percentage of hæmorrhage was three times greater in the former than in the latter. One hundred and fifteen cases of immature labor (late abortions) showed worse results, 91 pursuing a favorable course, 24 developing sepsis. Four cases of sepsis were fatal. Three of them were treated by manual removal, and death was laid directly to this, the author apparently forgetting his own statement, that interference was not resorted to "unless it was absolutely necessary;" in other words, unless the patient was *in extremis* from hæmorrhage or sepsis. His argument, based on a 20 per cent. mortality for operative cases against 2 per cent. for expectant, fails for the same reason. Fifteen cases are, moreover, too small a number to base sweeping deductions upon.

Winter[122] claims that the puerperium is not disturbed by retention of decidua, 38 per cent. of his cases becoming pregnant early, while after complete removal, conception was seen in only 6.29 per cent. Puppe[98] has published the results in Winter's clinic. Winter makes this concession to the advocates of active treatment, that partly detached and floating remnants of retained decidua might become dangerous, and hence should be removed. Olshausen, Schrœder, and Küstner[143] advocate the expectant plan also.

Varnier's[123] conclusions from a series of 501 cases are that retention of the placenta is exceptional, and retention prolonged for more than twenty-four hours is very unusual. He allows nature to act until the placenta is in the vagina, and then removes it manually. Immediate delivery is indicated in hæmorrhage, but he does not clear away the *débris*. He found "complete" expulsion to occur only 48 times in his series.

Boetus,[121] who first published satisfactory results in ten curettage cases, advises against a preliminary dilatation of the cervix, especially in presence of sepsis and inflammation of the adnexa, but uses the curette freely in all cases with good results. He found complicating pelvic disease improved after curetting, made worse by dilatation. Great care must be used to remove every part of the retained placenta (1877).

After an experience with 90 cases, Fehling[125] (1878) believes instrumental removal of ovum or secundines is absolutely without danger under antiseptic precautions, and favors active prophylactic interference, since it causes rapid involution and saves the woman subsequent suffering from pelvic disease. He was able to demonstrate the retention of decidua in all cases which he subjected to curettage. Eleven of his cases were septic when first seen, and two were fatal; but in these the source of infection was clearly traced.

Brion[82] reports 24 cases of retained placenta after abortion, with 11 deaths; he divides them into two chronological periods, 1883–1888, 1888–1892. During the first, irrigation only was employed; during the second, manual curetting was added. Four of eight cases (50 per cent.) died in the first period; five of twenty (25 per cent.) in the second. Three and four respectively were far advanced in sepsis when admitted to the Hospital. Omitting these, the percentages are 20 and 6.6, difference enough to make the author pronounce in favor of active treatment and most careful

antisepsis. His preference for the finger is founded on its sensitiveness. He gives these indications for interference:

1. In case of death and maceration of the fœtus.

2. In every case after incomplete abortion in which the temperature rises to 38 degrees Centigrade. The patient must be at once *isolated* and *delivered*. The accidents in abortion are sepsis and hæmorrhage, but as to their relative frequency it is difficult to say. Sepsis, however, occurred 24 times to 4 of hæmorrhage in the author's 28 cases of placental retention.

In his paper read before the Buffalo Obstetrical Society, M. Hartwig [126] lays down the rule that it is best to remove what may become septic if not already so. He finds dilatation seldom necessary, scraping the mucous membrane with a dull curette until nothing but blood comes away. Ergot, he finds, will not stimulate abortion, but will often prevent it.

Felsenreich [127] reports 20 cases of puerperal curetting, and finds it well borne in presence of parametritis and perimetritis, even of inflammation of the adnexa. He has seen women who aborted habitually, go to term after curetting.

Weekbecker-Sternfeld [107] prefer instrumental to digital curettage because (1) the danger of infection is less, (2) less room is required, (3) removal of decidual remnants is more positive, and (4) there is less disturbance and injury to the patient. They give as indications for the use of the instrument: (*a*) in the first three months (1) retention of ovum intact, adherent or (2) free; (3) retention of secundines; (*b*) in later months, for removal of placental cotyledons, (*c*) as an irritant in an atonic uterus, (*d*) for removal of placental polypoid growths.

Moses [128] has reported 61 cases of threatened and incomplete premature delivery. Ten were frankly septic, 51 non-septic. Expectant treatment was pursued in 19 cases, while 42 were curetted—7 for sepsis, 9 for hæmorrhage, 26 as a prophylactic measure. The result was apparently good in all cases, with a single exception, a septic patient *in articulo mortis* when brought in.

Braun [129] says every physician should know how to use a curette and use it; Pick [130] has employed it as a prophylactic procedure; Schwarz [131] recommends it whenever the ovum is not intact, and always in sepsis, even when the patient is in collapse.

Dahlmann [132] states that in 130 cases the tampon was indicated only four times, for the reason that, although it is the ideal method when practical, the physician is usually called too late to apply it. His method is digital curetting, followed by instrumental. The finger cannot remove the bits of tissue which, left behind, are fruitful sources of trouble. One hundred cases treated in this manner recovered without complication. Dahlmann has observed the usual chill and temperature rise in curetted septic cases, and though he believes in thoroughly cleansing the uterus, there was no decomposition seen in three of his incomplete cases of several months' duration.

Dührssen,[133] perhaps more than any other man, has brought the advantages of curettage home to every obstetrician. He empties the uterus as

soon as the abortion becomes inevitable. Two only of 152 cases treated by him died, in spite of the fact that many were advanced in sepsis when first seen, or had suffered from severe hæmorrhages. Contrasting the expectant and active plans of treatment, he asks, "Why, if interference is to-day considered less dangerous than abortion, not make sure that everything has been removed, when it can be so readily done?" Involution and time are necessary for convalescence after abortion; the one is hastened the other cut short after curetting. This is, of course, a boon to the working classes. The expectant plan requires two weeks for itself alone; after instrumentation the patient leaves her bed on the fifth day. Pain and physical discomfort, as well as mental perturbation, are greater than in the expectant method. Moreover, a large proportion of so-called complete abortion cases are followed by hæmorrhages, subinvolution, acute and chronic sepsis. Hæmorrhage is always greater with expectant treatment. Not more than half an ounce is lost by instrumentation before the fourth month.

Dührssen, unlike Mundé, Boetus, and Buchner, does not use the curette to remove placenta after the twelfth week. It is not possible or safe to do so, and as a greater number of abortions occur at the third month, the method must be a combined one. The separation of the placenta is readily accomplished by the finger; the curette removes the decidua vera. In the first two months, clearage can be accomplished with curettage alone, the canal admitting the finger with difficulty and pain if anæsthesia is not used. Uterine atony, as in our cases, is controlled by irrigation, and tamponade with iodoform gauze. Ergot is rarely called for: the placental forceps occasionally.

Döderlein,[134] also an advocate of active treatment, uses only digital curetting for recent cases, reserving the instrument for instances of acute and chronic endometritis. He employs anæsthesia always. If the os will not admit a finger, he uses a laminaria tent, and evacuates the next day. He reports 500 cases so managed in Zweifel's clinic, and has operated, as well, in 100 cases of profuse hæmorrhage following abortion. Of the 500 cases, three, septic when admitted, died under expectant treatment. The 100 cases showed polypi and endometritis, and took weeks to cure.

Rochet[87] pursues much the same plan, dilating with tents, and scraping first with a blunt, then with a sharp, curette without anæsthesia. With a large curette, he claims, there is little danger of perforating the uterus.

Eckstein[135] has reported 66 cases which were curetted, and, in spite of complications, all made good recoveries. In septic cases, he particularly declares no time should be lost in clearing and disinfecting the uterine cavity.

Authors might be quoted in this connection in practically endless array, for new ones are constantly being added to the already long list. We may be excused for naming in addition, as increasing the weight of experience on the side of interference, Palmer, Bonifield,[136] Locke,[137] Grigoriawitz (60 cases with one death), Kuppenheim[138] of Heidelberg (100 cases, treated by manual and instrumental removal in the first three months, later by hand only), Chaliex,[139] Bibot,[140] von der Goltz.[141]

Between these two extremes of treatment stands the third class, composed of men who, not caring to interfere in every case, or even in a majority of cases, are still unwilling to allow nature to take its course when the uterus is a focus of septic infection. They claim that curettage does not always give good results even when done by skilled operators. Another objection offered is the elaborate preparation for operation. Charles [141] cites cases to prove the former objection, and considers curettage after abortion necessary only when there is an old endometritis, or when the finger fails to remove the placenta. Von Braun-Fernwald [145] holds that the passive attitude is best. Lauros [146] waits until urgent symptoms demand interference. Stratz [147] believes that active treatment is only required for hæmorrhage and fever, and, even when driven to it, prefers the finger to an instrument. In five only of 486 cases did he deem it necessary to use the curette. All of these were septic, and in all there was a tetanic condition of the uterus, due to previous administration of ergot. Demelin [148] advises removal of the placenta with two fingers at three months; at four months it can be left to nature. Velitz [149] concludes from a study of 4,333 cases in Tauffer's clinic that only when there are decided indications need one resort to interference. Doléris [150] is especially identified with *écouvillonage* of the uterus, a procedure similar to the cleaning of lamp chimneys, the organ being swept out. Misrachi [151] advocates it also. Porak [152] judged intervention necessary in only 25 cases out of 326, and in these the operation was extremely simple. His percentage of fever in cases of intervention was 36, and his mortality 4 per cent.; in spontaneous delivery, 10 per cent. and 0.3 per cent. respectively. He omits, however, all mention of details regarding sepsis, its appearance in expectant cases, etc., and the late results of his treatment. Misrachi [151] undertook to answer Dr. Porak, and stated that since he began interference in cases of retention, he had had 92 cases of abortion. In 60, or 65.2 per cent., intervention was necessary, the large proportion being caused by the character of his *clientèle*. In 47 cases he was called at the first symptom, and of these, 32 terminated spontaneously, in 15 he intervened (13 of hæmorrhage, 2 of sepsis). The proportion of bleeding controverts Porak's statement as to the negligibility of this as an indication for interference.

Treatment of the Premature Interruption of Pregnancy as Carried Out by This Hospital.

Treatment of Abortion.

By reference to the tables it will be seen that of the total 417 cases of abortion, 324 were subjected to some form of curettage; the average period between the time the cases first came under the observation of the Hospital official and the curettage being 8 hours 45 minutes in early abortions, 10 hours 48 minutes in late abortions. The diagnosis of inevitable abortion or of the fact that the accident had already occurred (incomplete?) being made, and leaving out of consideration the amount of hæmorrhage as an indication for interference, the patient is plainly told that an operation is necessary; and if, upon explaining the danger of the situation to her, con-

sent for curettage cannot be secured, she is treated according to Procedure I. or II. (see *infra*) or referred to another institution or her private physician. The patient's consent having been obtained, curettage is performed within as short a time as possible.

Procedure I.—As a rule, during the period covered by this article, the treatment of interrupted pregnancy in the first three months of gestation has been an active one, as the following table indicates:

Treatment in 417 Cases of Abortion.

	Early Abortions.	Late Abortions.
Instrumental curettage only	166	79
Combined instrumental and digital curettage	45	27
Digital curettage only	3	5
Intrauterine douche only	6	7
Expectant treatment	22	57
	242	175

Time that Elapsed Between First Visit by the Hospital Official and Operation.

	Early Abortions. 160 Observations.	Late Abortions. 96 Observations.
Average period	8 hours 45 minutes.	10 hours 48 minutes.
Longest period	3 weeks.	2 weeks.
Shortest period	Few minutes.	Few minutes.
Operation at once	In 129 cases.	In 55 cases.

In addition to the labor bag (see Report) which has already been sent to the patient's home, another one, known as the "curettage bag," is sent, which contains the following articles:

Contents of Curettage Bag.

Chloroform.	Gauze—one tube iodoform, one tube plain sterilized.
Mask and dropper.	Sterilized towels, 4.
Ether and cone.	Bichloride tablets.
Vaginal brush.	Carbolic acid.
Kelly pad.	Ergot.
Douche bag.	Whiskey
Rubber instrument trays, 3.	Agar-agar tubes and culture swabs, 4.
Crutch.	Catheter, glass.
Nail brushes, 3.	Sims's speculum.
Solution pans, 2.	

Fig 1.—Curettage Bag.

Edebohls's speculum.	Douche tube, glass.
Volsella, 2.	Sterilized cotton, two tins.
Dressing forceps, 2.	Soap.
Curettes, 3 sharp and 3 blunt.	Lysol.
Uterine sound.	Alcohol.
Cervical dilator.	Digitalis.
Bandage scissors.	Strychnine.
Fritsch return catheter.	Agar-agar exposure-plate, 1.

Two of the resident staff of the Hospital, accompanied by one or more students, the latter for the purpose of instruction, then proceed to the case; all preparations are made, the patient is anæsthetized (with ether in most cases), placed upon the kitchen table so as to secure light from window or lamp, the Kelly pad adjusted, and the legs are secured in the lithotomy position by canvas crutch. (See Fig. 1.)

The vulva now is usually shaved, and always scrubbed with lysol solution, five per cent., or with green soap, using a stiff brush. The vagina is then cleansed with the same solutions, and at different periods in the service of the Hospital a stiff brush, a soft five-inch jeweler's brush, and swabs of sterilized absorbent cotton or gauze upon long dressing forceps have been used for this purpose.

The field of operation, including the vagina, is now cleared of soap with boiled water, and a final thorough irrigation with sublimate solution ($\frac{1}{3000}$) follows.

By means of towels, sterilized and brought from the Hospital, the immediate septic surroundings are covered so as to exclude contact infection.

The perineum is now depressed with a speculum, the cervix grasped and brought down with a volsella forceps, and, if required, the os is freely and rapidly dilated with a steel dilator of the Goodell type.

The uterine cavity is now freely irrigated with a sublimate solution ($\frac{1}{5000}$), a digital examination is made, followed by another irrigation, and the uterus is thoroughly curetted, usually both sharp and dull instruments being used, and during the operation the cavity is repeatedly washed out.

At certain periods in the history of the Hospital, the use of the sharp curette has been confined to cases in which evidences of chronic inflammation of the uterus were present.

Iodoform gauze was not made use of for drainage among the earlier cases; later the uterus and vagina were rather tightly packed; and in the more recent cases a single strip only of gauze was introduced to the fundus, and the vagina rather tightly packed with the same material.

Bacteriology.—For purposes of bacteriological study, four cultures are taken at the time of the operation, the first and second from the vagina and uterus before cleansing these parts, and the third and fourth from the same points after cleansing and curetting. (See Bacteriology.)

In instances in which the diagnosis of abortion is questionable, no embryo, fœtus, or placenta having been found, but the symptoms point to an incomplete abortion, scrapings obtained with the curette are placed in

alcohol, marked with the Hospital number of the case, and sent to the pathologist for microscopical examination. (See Pathology.)

Procedure II.—During certain periods a few cases of inevitable or incomplete abortion, in which the patient refuses to take an anæsthetic, and in which all symptoms of sepsis are absent, have been accepted by the Hospital and treated on a partially expectant plan.

The patient is placed in the lithotomy position and the vulva and vagina are cleansed as in Procedure I. Then, if the dilatation of the os permits it, curettage is performed as above, otherwise nothing further is done. In a few of these cases of the incomplete variety, the uterus was irrigated with a sublimate solution, and, if possible, a strip of gauze introduced for a drain.

Procedure III.—A few non-septic cases have been accepted in which all interference other than a digital examination has been refused by the patient.

Here a purely expectant treatment was followed, the external genitals only being washed with a sublimate solution ($\frac{1}{2000}$) before and after the digital examination. These cases could not be kept under observation very long, as the patients usually left their beds on the third or fourth day to attend to their housework.

After-Treatment.—Patients are kept upon fluid diet for two days after curettage, and the vulva is washed once or twice daily during the puerperium with a sublimate solution ($\frac{1}{2000}$). If the temperature and pulse remain normal the vaginal and uterine gauze is left *in situ* until the fourth or fifth day, then removed, and a vaginal sublimate douche ($\frac{1}{3000}$) given. Should evidences of sepsis show themselves, the vaginal gauze is first removed and the vagina irrigated; should they then persist, the uterus is emptied of gauze and irrigated, and the washing is repeated if necessary.

Treatment and Results in Our 242 Cases of Early Abortion.

Treatment of Early Abortions.

In the study of any particular line of treatment for abortion and the results obtained therefrom, the importance of making a distinction between cases of septic and non-septic when first seen cannot be too strongly emphasized.

The following tables will show at a glance the treatment and results in the several classes of cases:

Treatment in Early Abortions.	Cases.
Instrumental curettage	166
Combined instrumental and digital curettage	45
Digital curettage	3
Intrauterine douche only	6
Expectant treatment	22
Total	242

	Cases.
No. of cases of early abortion with fever when first seen	9
" " " without fever when first seen	233
Total	242

Treatment of 9 Cases of Early Abortion with Fever when First Seen.

	Cases.
Curettage (1 digital, 6 instrumental)	7
Expectant treatment	2
Total	9

Treatment of 233 Cases of Early Abortion without Fever when First Seen.

	Cases.
Instrumental curettage only	160
Combined instrumental and digital curettage	45
Digital curettage	2
Intrauterine douche	6
Symptomatic or expectant	20
Total	233

Cause of the Fever, Treatment, and Termination of the 9 Cases of Early Abortion with Febrile Symptoms when First Seen.

C. N.	Cause of Fever.	Treatment.	Duration of Symptoms.
213	Sepsis	Digital curettage	1 day.
727	"	Expectant	"
781	"	Instrumental curettage	3 days.
1,014	"	" "	1 day.
1,153	"	Expectant	3 days.
2,270	"	Instrumental curettage	Few hours.
5,457	"	" "	No record.
5,781	"	" "	5 days.
7,521	Tuberculosis and sepsis (?)	" "	3 days.

Results of the 233 Cases of Early Abortion that were without Febrile Symptoms when First Seen.

	Cases.
Undisturbed puerperium	214
Developed fever	19

Of the 214 cases that resulted in an undisturbed puerperium, the treatment was as follows:

	Cases.
Curettage	188
Expectant	26

CAUSE OF THE FEVER, TREATMENT, AND TERMINATION IN THE 19 CASES OF EARLY ABORTION THAT DEVELOPED FEBRILE SYMPTOMS IN THE SERVICE OF THE HOSPITAL.

C. N.	Cause of Fever.	Treatment.	Duration of Symptoms.
27	Sepsis	Instrumental curettage	1 day.
117	"	" "	3 days.
1,013	"	" "	2 days.
1,243	Bronchitis (?)	" "	3 days.
1,612	Sepsis	" "	5 days.
2,275	Unknown	" "	1 day.
2,327	"	" "	Few hours.
2,867	Pleurisy and sepsis	" "	4 days.
3,565	Sepsis	" "	No record.
3,763	Unknown	" "	Few hours.
4,161	Sepsis	" "	6 days.
4,252	Tuberculosis	" "	Few hours.
4,909	Unknown	" "	" "
5,617	Sepsis	" "	2 days.
5,732	Constipation	" "	Few hours.
6,223	Sepsis	" "	2 days.
6,719	Unknown	" "	Few hours.
7,022	Pneumonia	" "	No record.
7,738	Constipation	" "	3 days.

TREATMENT AND RESULTS IN OUR 175 CASES OF LATE ABORTION.

Treatment of Late Abortions.

As will be seen by reference to our table of the premature interruption of pregnancy, from the beginning of the fourth until the completion of the sixth and three-fourths month of gestation, the treatment is usually of the active variety in the early portion of this period, because clinically we are unable to draw the line so sharply between early and late abortions as some authorities would have us do, and in the fourth, fifth, and sixth months the treatment becomes less and less aggressive, until it gradually merges into that of premature labor and labor at term.

TREATMENT IN LATE ABORTIONS.

	Cases.
Instrumental curettage	79
Combined instrumental and digital curettage	27
Digital curettage	5
Intrauterine douche only	7
Expectant treatment	57
Total	175

The following table shows at a glance the ratio of actual interference progressively diminishing in the successive months:

Delivery of the Placenta in Late Abortions, Showing Ratio of Intrauterine Interference Diminishing in the Successive Months.

Month of Gestation.	Instrumental Curettage.	Spontaneous Delivery.	Manual Extraction.	Expressed.	Not Noted.	Ratio of Intrauterine Interference.
At 4th month, including 3½ months	66	7	7	1	7	73–88 = 1 in 1
At 5th month	15	12	3	2	5	18–37 = 1 in 2
At 6th month, including 6½ months	3	18	10	15	4	13–50 = 1 in 4

Recognizing as we do the fact that the real criterion of late abortions is the marked prolongation of the third stage of labor, naturally the interest centres at this point.

It is obvious that the tendency in our treatment has not been to await the natural course, the spontaneous detachment and expulsion of the placenta, even in cases not complicated by dangerous hæmorrhage or sepsis of the secundines, but to clear the uterus as quickly as possible after the diagnosis of an inevitable or incomplete abortion is made.

Cases falling in the first portion of this period are subjected to the same active treatment, already described, as is applied to instances of inevitable or incomplete abortion. Not only do we believe that the character of the outdoor service and environment of the patients demand and justify this course, but the results obtained strengthen our position.

Here again we cannot too strongly emphasize the importance of making a distinction, when giving the results of any particular line of treatment for the premature interruption of pregnancy, between cases nonseptic when first seen or operated upon and those that are septic.

The following tables indicate the line of treatment in 175 cases of late abortion, of which 20 were febrile when first seen, and 155 were nonfebrile.

Treatment in Late Abortions.

	Cases.
Instrumental curettage	79
Combined instrumental and digital curettage	27
Digital curettage	5
Intrauterine douche only	7
Expectant treatment	57
Total	175

Delivery of the Placenta in Late Abortions.	Cases.
Spontaneously delivered	35
Placenta expressed	19
Placenta removed manually by Hospital official	26
Curettage after manual removal	87
Not noted on history	8
Total	175

No. cases of late abortion with fever when first seen	20
" " " " without fever when first seen	155
Total	175

Treatment of the 20 Cases of Late Abortion that had Fever when First Seen.

	Cases.
Placenta delivered spontaneously	2
Placenta expressed	2
Placenta manually removed by Hospital official	4
Curettage after manual removal	4
Instrumental curettage	12

Results of the Treatment of the 20 Cases of Late Abortion that were Febrile when First Seen.

The following table gives the cause of the fever, the treatment, and the duration of the symptoms in the 20 cases of late abortion with fever when first seen by the Hospital official.

C. N.	Cause of Fever.	Placenta.	Curettage.	Duration of Symptoms.
215	Sepsis	Manual extraction	Instrumental	Few hours.
283	"		"	1 day.
871	"		"	Unknown.
1,177	"		"	3 days.
1,662	"		"	Few hours.
1,785	"		"	2 days.
2,192	"	Spontaneous	Digital	"
2,755	"	Manual extraction	Instrumental	4 days.
3,803	"		"	1 day.
4,774	"	Spontaneous	"	2 days.
5,044	"		"	Few hours.
5,219	"		"	" "
5,647	"		"	" "
5,792	"		"	1 day.
6,385	"	Manual extraction	"	"
6,562	Unknown	Expressed		"
6,915	Sepsis		Instrumental	Few hours.
7,679	"		"	14 days.
8,087	Constipation	Manual extraction	"	Few hours.
9,643	"	Expressed	Expectant	" "

TREATMENT OF THE 155 CASES OF LATE ABORTION THAT WERE NON-FEBRILE WHEN FIRST SEEN.

	Cases.
Placenta spontaneously delivered	33
Placenta expressed	17
Placenta removed manually by Hospital official	25
Curettage after manual removal	72
Not noted	8
Total	155

RESULTS OF THE TREATMENT OF THE 155 CASES OF LATE ABORTION THAT WERE NON-FEBRILE WHEN FIRST SEEN.

	Cases.
Undisturbed puerperium	137
Developed febrile symptoms	18

CAUSE OF THE FEVER, TREATMENT, AND DURATION OF THE SYMPTOMS IN THE 18 CASES OF LATE ABORTION THAT DEVELOPED FEBRILE SYMPTOMS IN THE SERVICE OF THE HOSPITAL.

C. N.	Cause of Fever.	Placenta.	Curettage.	Duration of Symptoms.
64	Sepsis	Spontaneous	Instrumental	Few hours.
407	"	Manual extraction		2 days.
567	Bronchitis	Expressed		1 day.
580	Sepsis	Manual extraction		"
911	Unknown	Expressed	Instrumental	"
939	Sepsis	Manual extraction		3 days.
1,055	"	" "	Instrument. and dig.	2 days.
1,267	Constipation.	Spontaneous		Few hours.
1,326	"	Broken up	Instrumental	" "
1,922	Sepsis	Expressed		4 days.
4,198	"	Spontaneous		1 day.
4,242	"	Broken up		Few hours.
4,309	Constipation.	" "	Instrument. and dig.	" "
5,051	Unknown	" "	Instrumental	" "
5,635	"	Manual extraction	Instrument. and dig.	" "
5,656	Sepsis	Broken up	Instrumental	" "
7,260	"	Expressed		8 days.
8,872	"	Spontaneous	Instrumental	3 days.

NOTE.—Winckel and Stumpf in their 115 cases of late abortion found that manual detachment of the placenta was strictly indicated in 8 cases only, or 6.95 per cent.; the placenta was delivered spontaneously in 77 cases, expressed in 17, removed or attempt at removal made by an outside physician in 7 cases, removed manually by their own physicians in 8.

Of their 115 cases, 6 were fatal in consequence of immature labor,

5 of sepsis, 1 of hæmorrhage. Three of the four cases of fatal sepsis had been subjected to manual removal of the placenta, giving a mortality for manual interference of 20 per cent., and for expectant or symptomatic treatment of only 2 per cent.

They also claim a morbidity from sepsis under an expectant treatment of 14.5 per cent., and under operative interference of 40 per cent.; but they do not inform us what proportion of their cases were septic when seen, and what proportion became so under an expectant treatment. To quote their own words, "On the strength of these figures one might well, and with a clean conscience, defend and advocate a symptomatic treatment as opposed to the operative." In 35 of their cases the third stage was allowed to continue over six hours.

Treatment and Results in Early and Late Abortions in the Several Months of Gestation.

EARLY ABORTIONS.

	Cases.
Second month	69
Third month	165
Unknown	8
Total	242

Of the above 242 cases belonging to the *first three months*, 233 showed no febrile symptoms when first seen by the Hospital official, 9 showed febrile symptoms when first seen.

TERMINATION OF 233 CASES NON-FEBRILE WHEN FIRST SEEN.

	Cases.
Subjected to immediate curettage	131
Allowed to run a spontaneous course	102

Of 131 subjected to immediate curettage:

	Cases.	
Fever-free puerperium resulted	120 or	91.60%
Fever resulted	11 "	8.39%

Total duration of fever in 11 cases was 17 days; average duration, one and one-half days.

Of 102 cases of early abortion allowed to run a spontaneous course, fever-free puerperium resulted in all 102 cases.

TERMINATION OF 9 CASES FEBRILE WHEN FIRST SEEN.

	Cases.
Subjected to immediate curettage	8
Allowed to run a spontaneous course	1

Of the 8 curettage cases, fever lasted 15½ days in 7 cases; 1 case no record; average duration, 2 days.

Late Abortions.

Of 88 cases belonging to the *fourth month*, 76 showed no febrile symptoms when first seen by the Hospital official, 12 showed febrile symptoms when first seen.

Termination of 76 Cases Non-Febrile when First Seen.

	Cases.
Subjected to immediate curettage	54
Manual extraction of the placenta	7
Allowed to run a spontaneous course	15
Total	76

	Cases.
Fever-free puerperium resulted	72
Fever resulted	4

Termination of the 12 Cases that were Febrile when First Seen.

	Cases.
Subjected to immediate curettage	12
Allowed to run a spontaneous course	0

Of the curettage cases, fever lasted 16½ days in 12 cases; average duration of fever, 1.30 days.

Of 37 cases belonging to the *fifth month*, 36 showed no febrile symptoms when first seen by the Hospital; 1 showed febrile symptoms when first seen.

Termination of the 36 Cases of Fifth Month, Non-Febrile when First Seen.

	Cases.
Subjected to immediate curettage	14
Manual extraction of placenta alone	3
Allowed to run a spontaneous course	19
Total	36

Of the immediate curettage cases, fever lasted four days in one case.

Termination of the one case of the *fifth month* that was febrile when first seen—subjected to immediate curettage. Fever in this case lasted four days.

Of 50 cases belonging to the *sixth month*, 46 showed no febrile symptoms when first seen by the Hospital. Four showed febrile symptoms when first seen.

Termination of the 46 Cases of the Sixth Month, Non-Febrile when First Seen.

	Cases.
Subjected to immediate curettage	0
Manual extraction of placenta alone	10
Allowed to run a spontaneous course	36
Total	46

	Cases.
Fever-free puerperium resulted	38
Fever during puerperium resulted	8

Termination of the 4 Cases of the Sixth Month that were Febrile when First Seen.

	Cases.
Subjected to immediate curettage	3
Allowed to run a spontaneous course	1

Of the immediate curettage cases, fever lasted 3½ days in 3 cases; average duration, 1.13 days.

Of 6 cases of interrupted pregnancy in which month of gestation was unknown, 6 showed no febrile symptoms when first seen by the Hospital. None showed febrile symptoms when first seen.

Termination of the 6 cases of unknown month, non-febrile when first seen—subjected to immediate curettage, 6.

Of the primary curettage cases, fever-free puerperium resulted in 6 cases; fever during puerperium resulted in 0 cases.

Résumé of our 417 Cases of Early and Late Abortions, with Percentage of Results.

Of the total 417 cases, 388 showed no febrile symptoms when first seen by the Hospital; 29 showed febrile symptoms when first seen.

Termination of the 388 Cases that were Non-Febrile when First Seen.

	Cases.		
Subjected to immediate curettage	203	or	48.68%
Manual extraction of placenta	25	"	5.99%
Expression of placenta	17	"	4.07%
Not noted	8	"	1.91%
Allowed to run a spontaneous course	135	"	32.37%
Total	388		

Of the immediate curettage cases, fever during puerperium resulted in 15 cases, or 3.59%.

Of the manual extraction of the placenta cases, fever during puerperium resulted in 5 cases, or 1.19%.

TERMINATION OF THE 29 CASES THAT SHOWED FEBRILE SYMPTOMS WHEN FIRST SEEN.

	Cases.
Subjected to immediate curettage	25 or 86.2%
Allowed to run a spontaneous course	4 " 13.8%

Total number of cases out of the 417 abortions that were non-febrile when first seen, but developed fever in the service of the Hospital, 37.

TABLE OF TOTAL NUMBER OF CASES OUT OF OUR 417 ABORTIONS THAT SHOWED FEBRILE SYMPTOMS EITHER WHEN FIRST SEEN BY THIS HOSPITAL OR SUBSEQUENTLY, WITH TREATMENT.

66 cases of fever among 417 abortions, or 15.83%.

- Expectant treatment, 13 cases.
  - Non-febrile when first seen, 8 cases.
  - Febrile when first seen, 5 cases.
- Active interference, 53 cases.
  - Non-febrile when first seen, 29 cases.
  - Febrile when first seen, 24 cases.

Treatment of Spontaneous Premature Labor.

The treatment of spontaneous premature labor in our service has practically been the same as that of labor at term, as is indicated in the following table:

TREATMENT IN 218 PREMATURE LABORS.

	Cases.
Instrumental curettage only	6
Digital curettage only	2
Intrauterine douche only	27
Expectant treatment purely	183
Total	218

Although we have already set forth under Prognosis the manner of placental delivery, still we give the table here:

PLACENTAL DELIVERY IN 218 PREMATURE LABORS.

	Cases.
Spontaneous delivery	47
Expressed	145
Manually removed	20
No record	8
Total	220

Regarding the apparently large number of placentæ manually removed, it must be remembered, as stated in another place, that there were eight cases of placenta prævia among the 218 cases of premature labor.

Fever in Our 218 Cases of Spontaneous Premature Labor.

Of our 218 cases of spontaneous premature labor, the histories show febrile symptoms either at the time the cases were first seen by the Hospital officials, or subsequently, in 42 instances, or 19.27%.

The following table indicates the causes of the fever in these 42 cases:

Causes of Fever in Spontaneous Premature Labor.

	Cases.
Fever due to sepsis	20 or 9.27%
" " mastitis	4
" " constipation	3
" " pneumonia	3
" " mastitis and sepsis	2
" " abscess of breast	1
" " tuberculosis (pulmonary)	1
" " eclampsia	1
" " unknown cause	7
Total	42

The following table indicates the duration of fever, the day of highest temperature, and cause of the fever in the 42 cases that were febrile either before or after being seen by this Hospital:

Fever in Spontaneous Premature Labor.

C. N.	Duration of Fever.	Day of Highest Temp.	Cause of Fever.	C. N.	Duration of Fever.	Day of Highest Temp.	Cause of Fever.
150	30 days.	2d day.	Sepsis.	3,030	1 day.	2d day.	Constipation.
161	12 "	4th "	"	3,058	1 "	1st "	Unknown cause.
257	4 "	4th "	"	3,324	1 "	1st "	Sepsis.
311	2 "	4th "	"	3,661	.....	L. "	Unknown cause.
357	4 "	4th "	Pneumonia.	3,854	.....	2d "	Abscess of breast.
388	1 "	3d "	Unknown cause.	4,235	2 days.	1st "	Sepsis.
393	1 "	6th "	Mastitis.	4,800	2 "	2d "	"
418	6 "	4th "	Pneumonia.	5,223	6 "	5th "	"
446	2 "	3d "	Sepsis & Mastitis.	5,357	2 "	4th "	"
657	2 "	3d "	Mastitis.	5,582	2 "	5th "	Mastitis.
688	2 "	3d "	"	5,945	.....	3d "	Phthisis.
885	1 "	L. "	Sepsis.	6,128	1 day.	7th "	Simple rise.
889	2 "	L. "	Constipation.	6,148	.....	.....	Sepsis.
942	1 "	2d "	"	6,423	1 day.	1st day.	Cause unknown.
1,026	2 "	1st "	Sepsis.	6,880	4 "	2d "	Sepsis.
1,308	1 "	3d "	Sepsis & Mastitis.	7,070	.....	2d "	Eclampsia.
1,639	2 "	5th "	Sepsis.	7,167	.....	L. "	Sepsis.
1,723	7 "	7th "	Pneumonia.	8,303	1 day.	3d "	"
2,206	.....	4th "	Sepsis.	8,643	1 "	4th "	Cause unknown.
2,573	1 day.	4th "	"	9,287	1 "	4th "	Sepsis.
2,695	2 "	3d "	"	9,753	1 "	3d "	Unknown.

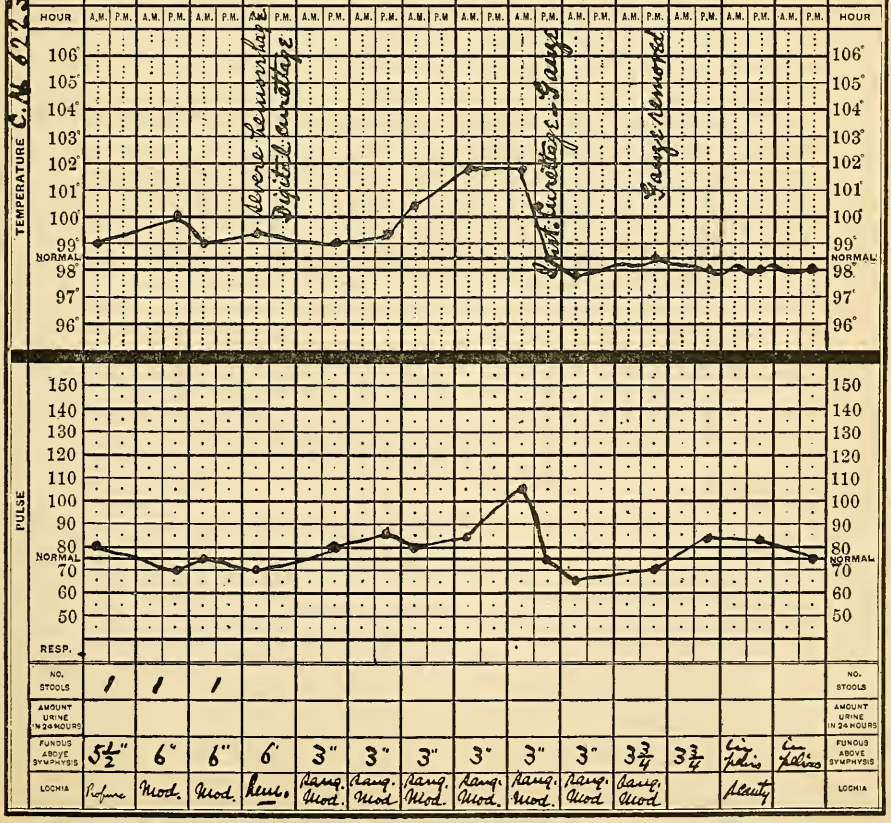
Total, 42 cases of fever, or 19.27 per cent. of 218 cases.

Types of Early and Late Abortions and Spontaneous Premature Labors, with Symptoms, Treatment, and Results.

Case I.

Early abortion; mistaken diagnosis; profuse hæmorrhage; digital curettage, followed in five days by instrumental curettage; fever before latter curettage, none after; good recovery.

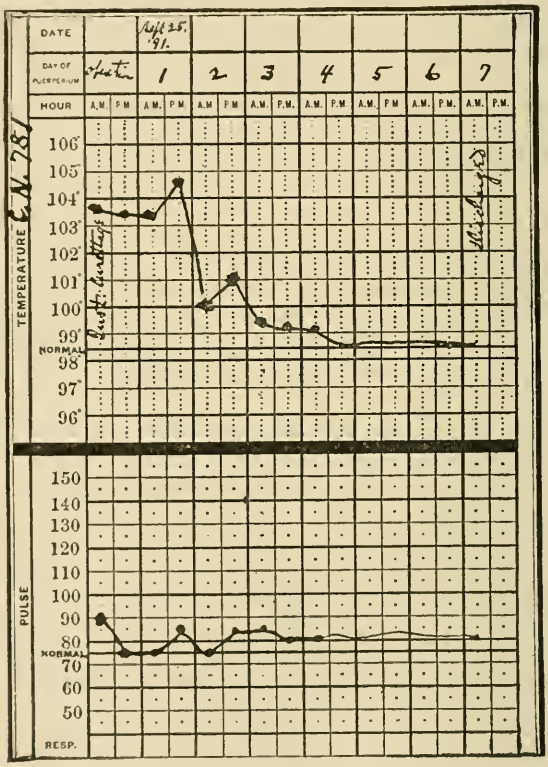
C. N. 6,223.—Second month of gestation; first seen May 18th; thought at this time to be a case of complete abortion; mistaken diagnosis; upon May 22d, four days after, a profuse hæmorrhage occurred, which threw the patient into collapse, causing her to lose consciousness, and necessitating the free use of stimulants; the embryo and decidua were digitally removed at this time; upon May 27th, the fifth day of the puerperium, the uterus was thoroughly curetted with both sharp and dull curettes, ether being used, and a quantity of foul-smelling decidua removed; the uterus at this time was packed with gauze; this patient suffered from persistent headache throughout the puerperium (syphilis?); after being under observation for fifteen days, and the lochia having ceased, the patient was discharged.



Case II.

Incomplete early abortion; long-continued hæmorrhage; sepsis; curettage; good recovery.

C. N. 781.—Incomplete abortion; third month; duration of symptoms three weeks; profuse hæmorrhage; temperature when first seen, 103.5 degrees; immediate instrumental curettage and uterine irrigation; temperature immediately after operation, 103.2 degrees; normal temperature and pulse on third day after operation; patient left her bed on the sixth day, and was discharged in good condition on the seventh day. (See Temperature Chart.)



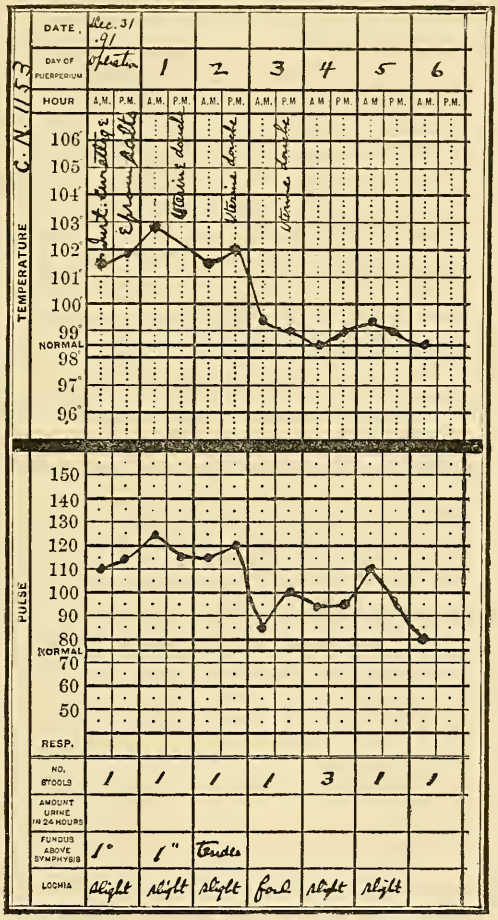
Case III.

Early incomplete abortion; severe hæmorrhage; immediate curettage; metritis; subsequent labor at term.

C. N. 1,153.—Third month of gestation; one previous abortion; first seen by the Hospital, December 31, 1891; patient at this time was very weak from uterine hæmorrhage which had continued for four days; history of an incomplete abortion two days previous; temperature when seen, 101.2 degrees; pulse, 110; os admits only one finger; immediate instrumental curettage; pieces of decidua removed; sublimate uterine irrigation;

temperature after operation, 101.4 degrees; pulse, 112; painful uterus on first and second days; foul lochia on fourth day; uterine irrigations on first, second, and fourth days; bowels acted on freely with Epsom salts; stimulated with whiskey and given quantities of milk because of anæmic condition; discharged on sixth day. (See Temperature Chart.)

This patient was subsequently delivered of a living child at term. No history of subsequent interrupted pregnancies.



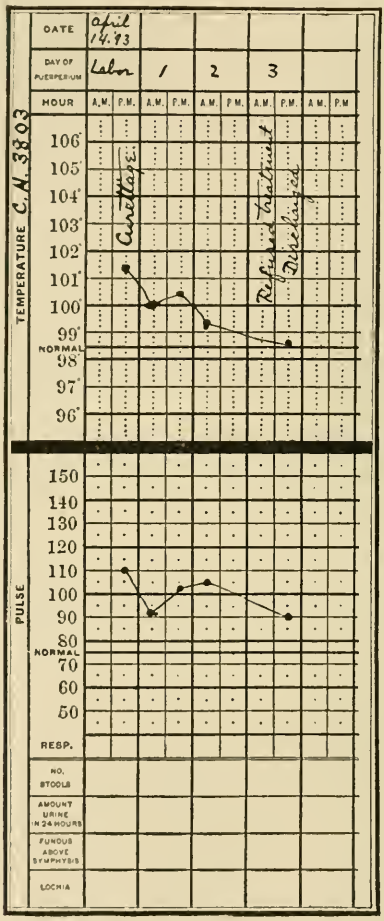
Case IV.

Incomplete late abortion; sepsis; profuse hæmorrhage; curettage; syphilis; cardiac disease.

C. N. 3,803.—Month of gestation, third and one-half; when first seen, temperature, 101.2 degrees; pulse, 110; fœtus had come away half an hour before, accompanied by profuse hæmorrhage; placenta was found plugging the os, which latter admitted two fingers readily; placenta was removed by digital traction; uterus curetted instrumentally, and uterine sublimate douche

given; very little hæmorrhage after operation; twenty-four hours after operation, temperature, 100.6 degrees; pulse, 102. This case was suffering at the time from syphilis, with ulceration in the fauces.

Chronic cardiac disease and emphysema were also present in this case as complications. Upon the third day of the puerperium the patient refused further treatment, and was, consequently, discharged.



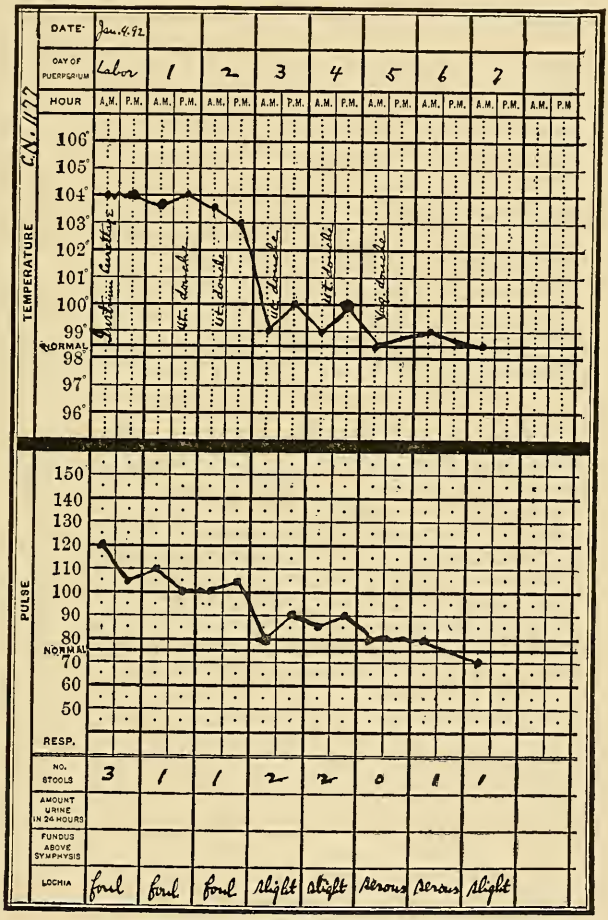
Case V.

Late abortion; sepsis; profuse hæmorrhage; perniterine inflammation; curettage; partial recovery.

C. N. 1,177.—Fourth month of gestation; first seen January 4, 1892, by this Hospital; history at this time of uterine hæmorrhage for several days past, for which, two days previously, vagina had been tamponed by a private physician; when first seen, temperature, 104 degrees Fahrenheit; pulse, 120; no hæmorrhage; hot, dry skin; headache; tympanitis; abdom-

inal pain and tenderness; pain, tenderness, and swelling in left broad ligament; vagina filled with foul-smelling clots; os the size of a five-cent piece. Treatment consisted in cleansing vulva and vagina, thoroughly curetting uterus with sharp curette, and irrigating with $\frac{1}{15000}$ sublimate solution, applying hot applications over abdomen, and in administering calomel, one-half grain every half hour for four doses.

Much foul-smelling *débris* was removed from the uterus, and the temperature and pulse after operation were 104 degrees and 106 respectively.



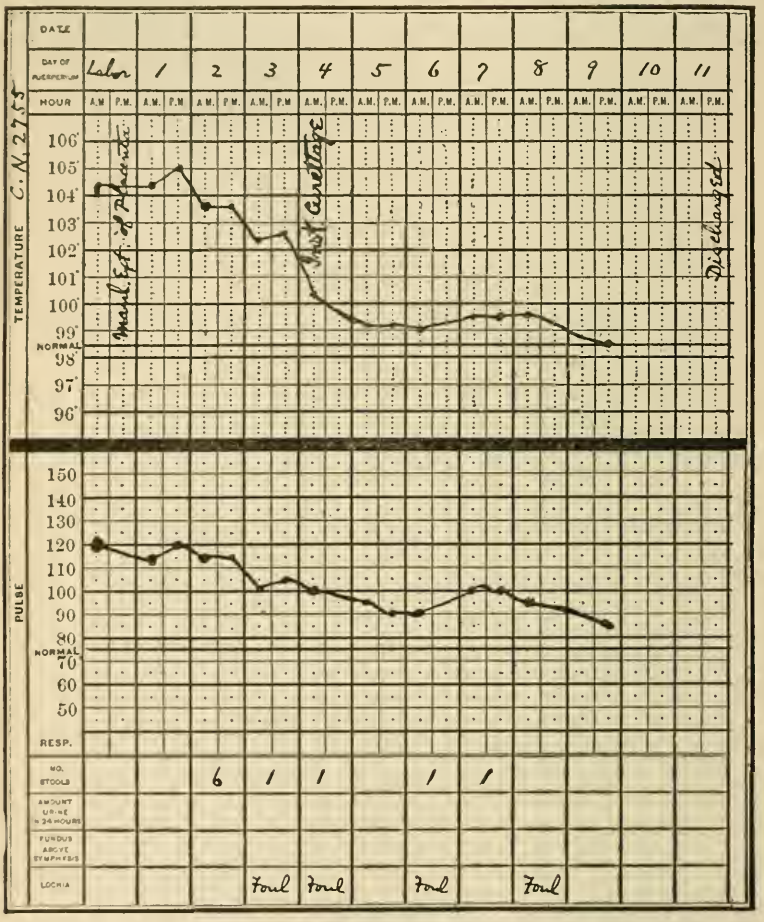
Uterus remained very sensitive for eight days; slight discharge after operation; abdominal tenderness and tympanitis continued for three days; tongue remained coated for five days, then cleared; well-marked parametritis and vaginitis (gonorrhœal?).

The bowels were fully moved after the calomel with salts; morphine was given for the severe pain, and the patient was supported with quinine, whiskey, and milk.

Patient discharged on ninth day, the parametritis in left broad ligament still giving some pain.

Case VI.

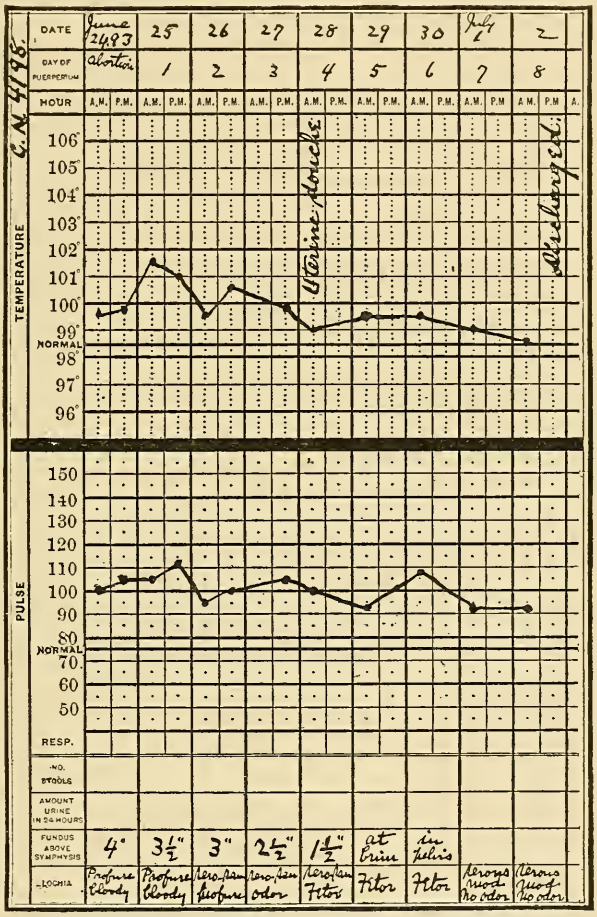
Late abortion; incomplete; acute sepsis; moderate hæmorrhage; curettage; cessation of fever; albuminuria.



C. N. 2,755.—Month of gestation, fifth and one-half; when first seen, temperature, 104.6 degrees; pulse, 120; incomplete abortion with retained and adherent placenta; moderate hæmorrhage; placenta was immediately extracted manually, and in so doing was broken up into many pieces; uterine sublimate douche was then given; the temperature chart shows that the fever continued for four days, and that the lochia was foul upon the third and fourth days; upon the fourth day of the puerperium instrumental curettage was performed, and several small pieces of placental tissue removed from the uterine cavity. As will be seen in the accompanying chart, there was practically no fever after the curettage; the curettage was followed by the usual sublimate uterine douche; albuminuria.

Case VII.

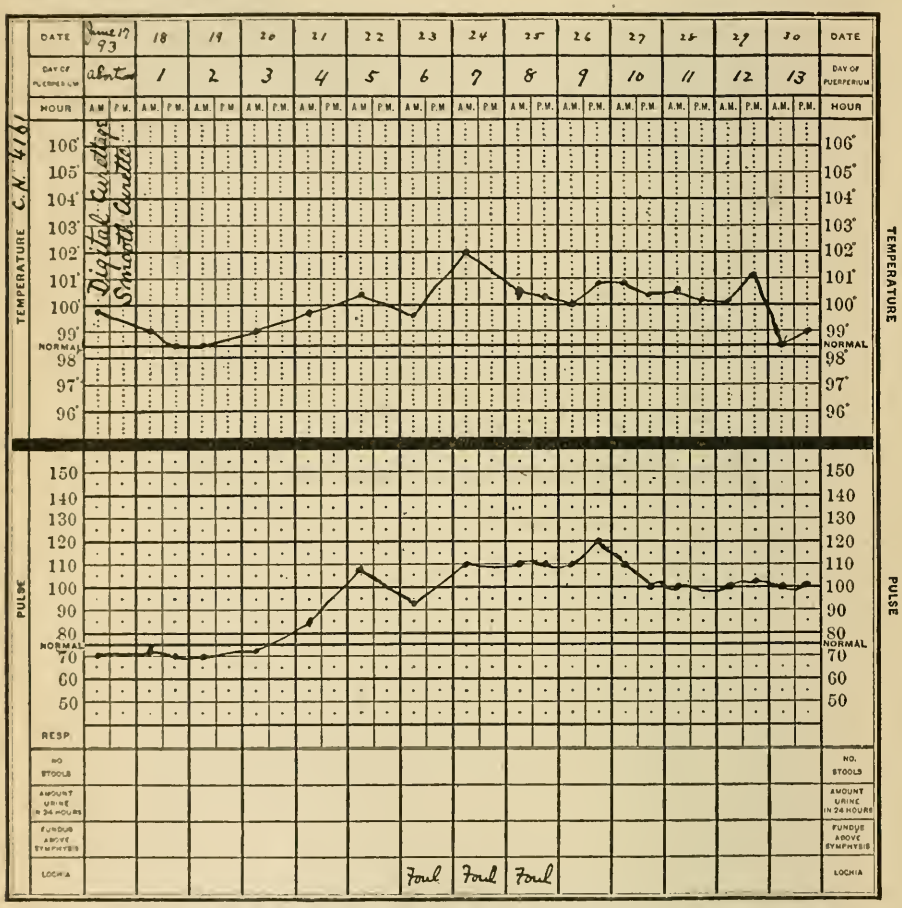
Late abortion; long-continued hæmorrhage; uterine douche; otherwise expectant treatment.


C. N. 4198.
DATE
June 24 25 26 27 28 29 30 July 1 2
DAY OF PUERPERIUM
abortion 1 2 3 4 5 6 7 8
HOUR
A.M. P.M.
TEMPERATURE
106 105 104 103 102 101 100 99 NORMAL 98 97 96
Uterine douche
discharged
PULSE
150 140 130 120 110 100 90 80 NORMAL 70 60 50
RESP.
NO. STOOLS
AMOUNT URINE IN 24 HOURS
FUNDUS ABOVE SYMPHYSIS
4" 3½" 3" 2½" 1½" at brim in pelvis
LOCHIA
Profuse Bloody Profuse Bloody Scanty Profuse Scanty odor Scanty Fetor Fetor Fetor Scanty mod. no odor Scanty mod. no odor

C. N. 4,198.—Abortion, sixth month; symptoms began ten days before being seen, at which time an abortion was threatened; in addition there was a history of an intermittent hæmorrhage for seven weeks previous; when first seen by the Hospital the fœtus was found presenting at the os uteri; a vaginal tampon was applied for one and a half hours; at the end of that time fœtus was expelled and placenta came away spontaneously, but broken up into several pieces; duration of third stage was ten minutes; fœtus was hydrocephalic and placenta markedly fatty; no curettage; single rise of temperature (101.8) on first day; at this time, also, a single piece of placenta was expelled: the membranes were incomplete, the retained portions being subsequently found in the vagina; we believe this fever was of septic origin; there were no mammary symptoms, nor tenderness of uterus.

Case VIII.

Early abortion; profuse hæmorrhage; digital curettage and smooth curette; perniterine inflammation; fever for eleven days; labor at term, fourteen months after.

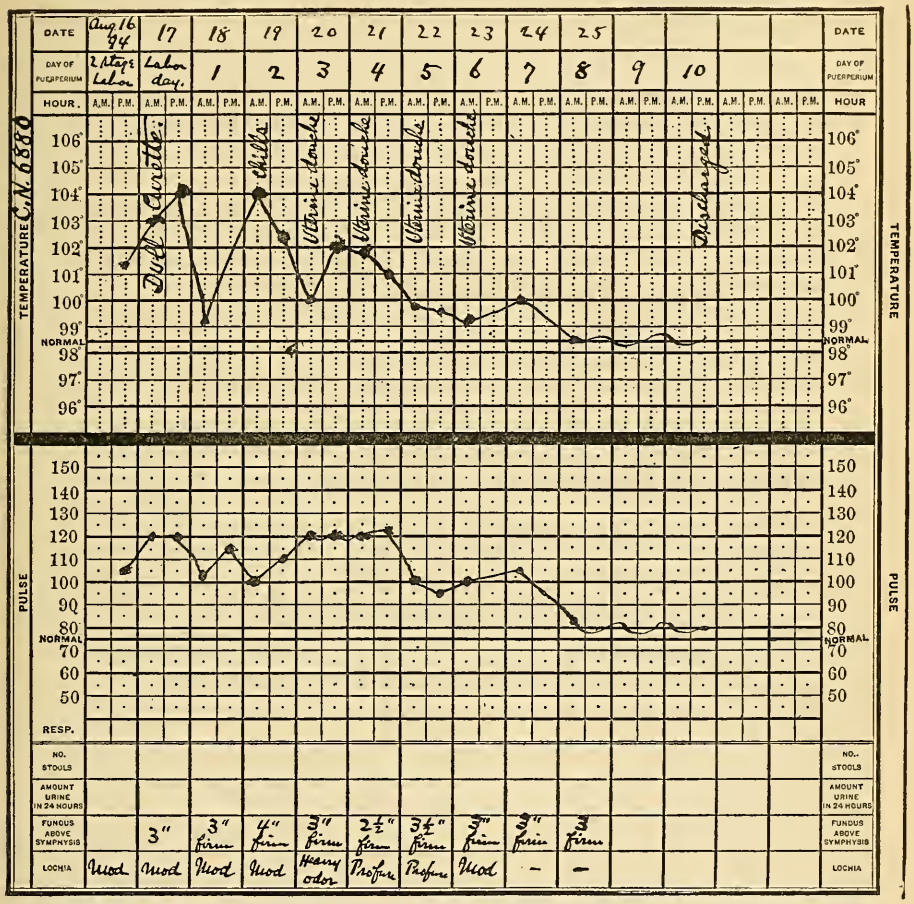


C. N. 4.161.—Third month of gestation; moderate hæmorrhage had been present for eight days, and profuse hæmorrhage for a few hours previous to being seen by this Hospital; ovum was found in the os and removed, the uterus then being curetted digitally and with smooth curette; this was followed by the usual intrauterine douche; on the fourth, fifth, sixth, and seventh days of the puerperium, abdomen was tender to pressure and tympanitic; free catharsis and hot applications to the abdomen used; on the ninth day pain and tenderness is recorded in both Fallopian tubes; temperature reached normal point on twelfth day; no fever thereafter; no uterine treatment was used after the curettage; patient discharged on the sixteenth day, in only fair condition, there being symptoms at this time of parametritis.

This patient was delivered of a living child at term, fourteen months (August, 1894) after the foregoing abortion.

Case IX.

Premature labor; morbid adhesion of placenta; fever; manual extraction of placenta; curettage; parametritis.



C. N. 6,880.—Primipara; month of gestation, seventh; first seen in second stage of labor, which lasted nine hours; temperature when seen, 101.2 degrees; pulse, 107; placenta, adherent and markedly fatty, was torn in the manual extraction; duration of third stage, thirty minutes; pieces of placenta left in uterus digitally removed as far as possible; twenty-four hours later temperature, 103 degrees; pulse, 120; chloroform; external genitals and vagina cleansed with lysol (5 per cent.) and sublimate solution ($\frac{1}{1000}$); uterus curetted with dull curette; pieces of placenta and membranes brought away; uterus irrigated with sublimate solution ($\frac{1}{10000}$) and packed with gauze; chill immediately after operation; temperature, 104 degrees; pulse, 120; temperature, 101 to 103 degrees for four days; gauze removed on second day; examination showed uterus bound down, and parametritis; no foul lochia; discharged on tenth day; culture from uterus showed absence of organisms before operation. (See Bacteriology.)

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OBSTETRICAL ASEPSIS AND THE RESULTS OF SIX YEARS' OUTDOOR SERVICE. — MORBIDITY AND MORTALITY STATISTICS OF 10,233 CASES.

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Obstetrical Asepsis in the Outdoor Service.

The following pages will describe the methods of applying the principles of surgical cleanliness to the needs of the outdoor service of this Hospital. The details are a result of the combined efforts of the members of the Medical Board, and no personal claim is made of priority or authorship. The routine work of the Hospital is done in the same manner every week of the year, without regard to the personal views of the attending physician who may be on duty. Of course this routine has been a thing of growth, and changes have at times been frequent, and often of a radical nature. But no change has been made without a previous discussion by the Medical Board and without the approval of a majority of the five attending physicians.

The outdoor service of the Lying-in Hospital has been described in previous Reports often enough to need no repetition at this time. It is a tenement-house service in the most densely populated district in the world. The application of the principles of surgical asepsis in such a service is a complex problem, which may be considered under three chief subdivisions:

I. Asepsis of apparatus.
II. Asepsis of operator.
III. Asepsis of patient.

Asepsis of Obstetrical Instruments and Apparatus.

The Labor Bag.—This Hospital depends upon its tenement-house patients to furnish at the time of their lying-in only a large pail for waste douche, a basin for hand washing, and a plentiful supply of hot water. All other apparatus which may be needed is taken to the case from the Hospital. The outdoor service employs twenty-four labor bags, one of which goes to every case. Each bag contains all the utensils needed for

the delivery of a normal case of labor. Its contents includes the following list of articles:

Rubber goods:
- Lying-in Hospital pad (Kelly).
- Douche bag.

Agate ware:
- Nest of three basins.

In glass bottles:
- Soft rubber catheter.
- Tape for cord.
- Linen for cord.
- Linen for eye wipes.

Drugs:
- Acetic acid.
- Alcohol.
- Ergot.
- Starch.
- Solution of silver nitrate, 1%.
- Compound cathartic pills.
- Bichloride of mercury tablets.

In glass boxes:
- Vaseline.
- Soap.

In copper or brass cans:
- Douche tubes.
- Vulva pads.
- Cotton wipes.
- Nail brush.

Other articles:
- Pelvimeter.
- Eye dropper.
- Scales.
- Scissors.
- Tape measure.

Blanks:
- Miniature labor and child charts.
- Report blanks.
- Birth certificate.
- Small blank pad.

These bags are made of leather and lined with leather. They are 17 × 9 × 9 inches in size; they open wide at the top, and one when filled weighs 20 pounds. One of them is represented in the accompanying cut (Fig. 1).

A room is specially devoted to the use of the outdoor department as a laboratory and is fitted up with the necessary glass tables, supply shelves, sinks, and sterilizers. The preparation of the dressings, the sterilization of the instruments, and the cleaning and refilling of the bags needed in the service are done in this room. A general view of the room is given in the accompanying plate (Fig. 2), and the special arrangement of the apparatus is shown in the plan on page 221 (Fig. 3).

The washtub (3) is of porcelain, and the dripboard (2) of glass. The tables are of simple construction and have glass tops. The table marked 11 in the plan has a central shelf (12) on which the stock bottles for solutions and a reserve supply of drug bottles are kept, for renewing broken articles when the bags are refilled. The shelves (17) over table (10) are for the storage of the copper cans of wipes, pads, douche tubes, and nail brushes. The remaining references to the plan explain themselves.

The Bramhall-Deane sterilizers are arranged to expose their contents to the action of steam under a pressure of ten pounds. The apparatus is a cylinder open at one end, and the steam is generated from water in the bottom, heated by a Bunsen flame underneath. The articles to be sterilized are placed upon a rack over the boiling water. There is a steam-gauge and safety-valve, which latter is set at ten pounds pressure (Fig. 4).

The work is done by the nurses, two of whom are on duty during the

Fig. 1.—Labor Bag.

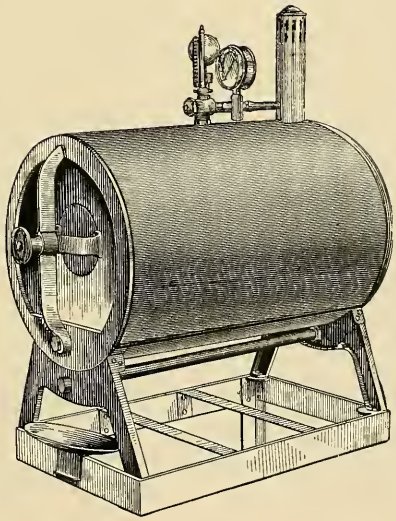

Fig. 4.—Steam Sterilizer.

FIG. 2.—NURSES' LABORATORY.

day. They leave the whole number of bags in condition for immediate use when going off duty each night, and it is a very unusual thing for the supply of clean bags to be exhausted by morning. The refilling of one of these labor bags involves a considerable amount of sterilization and cleaning, but a supply of articles already prepared is kept on hand, and the process is therefore much facilitated. When a bag is returned from a case, it is emptied of its contents, and is then wiped out with a cloth dampened

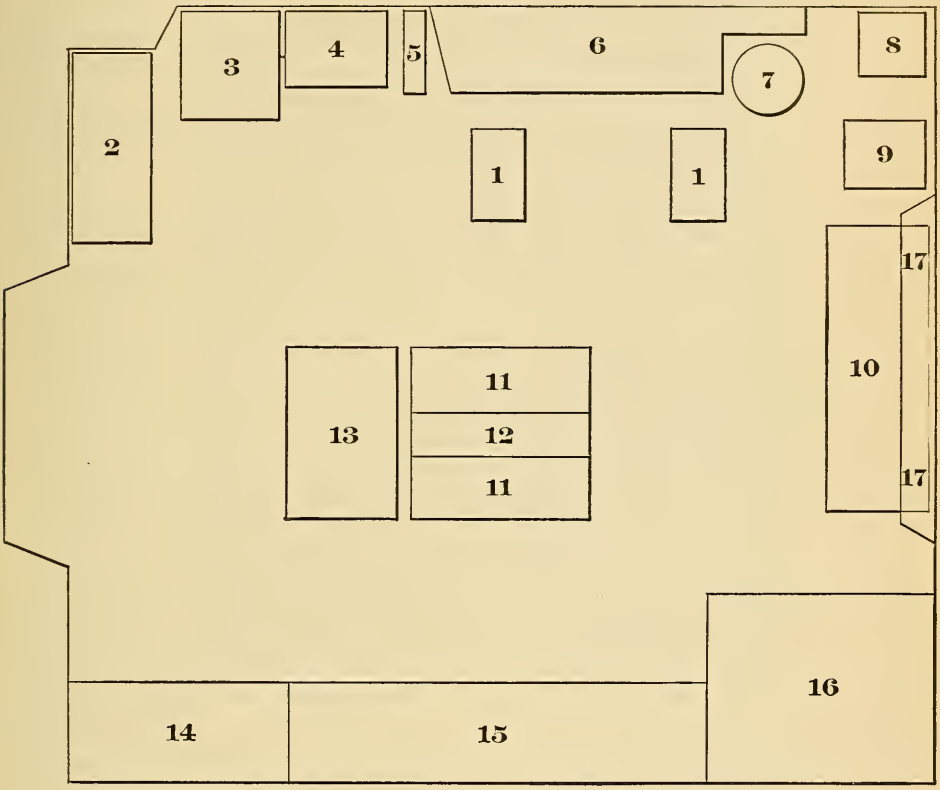

FIG. 3. PLAN OF NURSES' LABORATORY.

1, 1. Bramhall-Deane Sterilizers.
2. Glass table.
3. Porcelain washtub.
4. Glass table.
5. Towel Rack.
6. Range.
7. Boiler.
8. Soiled linen hamper.
9. Instrument case.
10. Glass table.
11. Glass table.
12. Central shelf.
13. Glass table.
14. Stock closet.
15. Shelves for bags.
16. Vestibule, separated by iron rail.
17. Shelves for copper cans.

with bichloride of mercury solution. It is filled immediately with a fresh supply, and is frequently used twice in twenty-four hours. Each of the varied list of articles contained in these bags demands a different treatment in order to render it surgically clean. The object of the system of preparation detailed below is to furnish for each confinement the necessary supply of aseptic dressings and apparatus.

The Lying-in Hospital bed pad is modified from the model of Dr. Kelly in such a way that the seams are less numerous and the pad more

durable (Fig. 5). One of these pads is used at every confinement to protect the bed from the blood and liquor amnii, and, what is equally important, to protect the patient from the infective bedding which is a constant accompaniment of the outdoor service. The pad is also used instead of a douche pan to receive the postpartum vaginal douche and convey the overflow to a pail on the floor. These pads are cleaned by washing with soap, water, and brush, and sterilized by scrubbing with carbolic solution (5 per cent.). Rubber does not stand the action of corrosive sublimate nor of heat either dry or moist. The life of a pad under this routine is twelve months.

The douche bag used is the ordinary four-quart fountain syringe, which is also made of rubber, and is cleaned and sterilized in the same manner as the rubber pad (Fig. 5). These bags are used exclusively for the giving of bichloride of mercury douches in normal labor cases. A bag under this care will last six months.

The three agate basins in the bag form a nest, for easy packing (Fig. 6). The larger two contain a pint, and the bichloride tablets are of such a strength that one in a pint makes a solution 1 to 2,000; these basins are used to hold the bichloride solution. One will be used for disinfecting the hands, and the other to contain the necessary amount of concentrated solution of corrosive sublimate to be added to the douche. The shallower basin is used to hold the scissors and tape for the cord and some of the eye wipes. These articles are placed upon the basin just before the end of the second stage, where they will be convenient when needed. These basins are sterilized by washing with sapolio and corrosive sublimate solution 1 to 1,000.

The douche tubes which are used for normal cases are straight vaginal tubes of glass (Fig. 13). A routine postpartum vaginal douche is given, and these tubes are used to diminish the chance of the douche being delivered into the uterus. The tubes have in the past been carried in glass cylinders which are shaped like large test tubes. Their blind end is perforated, and when in use both ends are plugged with absorbent cotton. These cylinders and their contents are sterilized in the pressure steam drums. It has been voted by the Medical Board to change these glass cylinders for those of brass, similar to the copper cylinders described below as being used for the dressings and nail brushes. Such a cylinder is shown in Fig. 9 below. The original cost of the brass is somewhat more than that of the glass, but the loss by breakage is practically nothing. Experience has shown also that the brass is better than the copper, because solid brass tubing can be purchased, while the copper must have a longitudinal seam along the side. The brass will therefore outlast the copper. The first cans were of nickel-plated zinc, but they did not stand the frequent exposure to steam, as the plating wore off and the zinc became oxidized.

The soft rubber catheter is the only form used in the outdoor service. It is sterilized by boiling in water, and is kept in a corked bottle immersed in saturated boracic acid solution. The tape used for tying the umbilical cord is bobbin, one-quarter inch wide. This is cut in lengths of twelve inches, and six such pieces are placed in a screw-top bottle. Small pieces

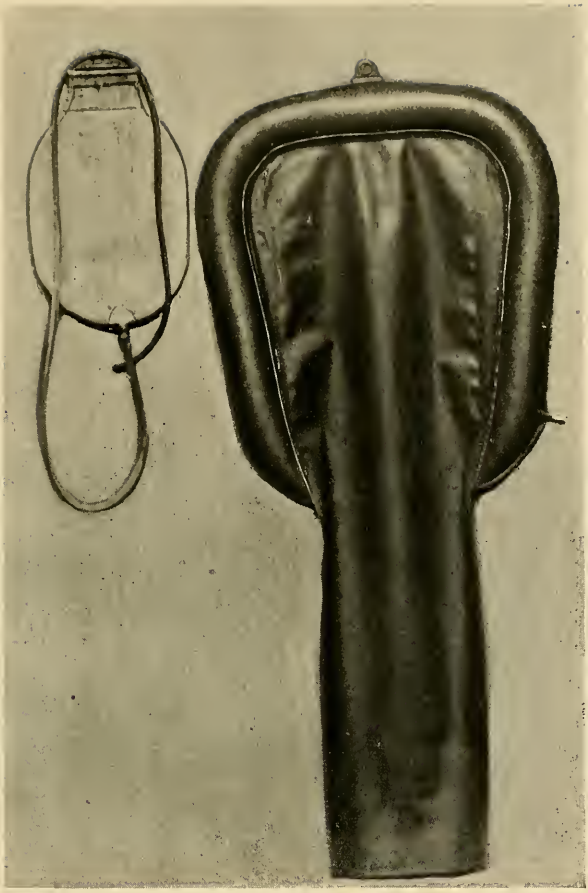

Fig. 5.—Bed Pad and Douche Bag.

Fig. 6.—Agate-ware Basins.

Fig. 7.—Bottles for Catheter, Tape, Dry and Wet Gauze.

Fig. 8.—Drugs Contained in Labor Bag.

Fig. 9.—Copper Cans for Cotton, Vulva Pads, and Nail Brush. Brass Cylinder for Douche Tubes.

of gauze two inches square are used to surround and protect the stump of the cord. These pieces of gauze are placed in a dry, four-ounce, salt-mouth glass bottle. These bottles containing tape and gauze are sterilized in the Bramhall-Deane sterilizer. Small squares of gauze similar to those used on the cord are kept immersed in an excess of saturated solution of boracic acid in a four-ounce, salt-mouth bottle. They are also sterilized, and are used to wipe out the baby's mouth and eyes immediately after birth (Fig. 7).

The list of drugs kept in the bags is a short one. The bottles are four-ounce tincture bottles. Ergot and dilute acetic acid are for use in case of hæmorrhage. Solution of nitrate of silver of one per cent. strength is to drop in the baby's eyes after birth, and tablets of bichloride of mercury, compound cathartic pills, starch, and alcohol complete the list. Soap and vaseline are carried in one-ounce ointment jars. The vaseline is used only to anoint the new-born baby, and never to lubricate the examining finger or hand. The ordinary yellow vaseline and commercial green soap are bought in 25-pound jars, and are transferred to the small service jars, which are then sterilized in the steam sterilizers (Fig. 8).

Absorbent cotton is bought in rolls of one pound. Two grades are purchased; the better is used for the surgical dressing of wounds and for the application of pressure to engorged breasts. The cheaper grade is used to make the absorbent vulva pads and to sponge and cleanse the genitals of the parturient and postpartum patients. This cheaper form of cotton is known in the trade as "cotton waste;" it is equally absorbent and clean, but does not lie in the lap so smoothly as does the better grade. It also contains small, hard masses of matted cotton. The roll of waste is cut into sections four inches long, and is then unrolled and divided into pieces about four inches square and half an inch thick. Two of these squares rolled in a piece of absorbent gauze to make a flat package $1 \times 2 \times 8$ inches form the vulva pad of the outdoor service.

These pads are packed in cylindrical copper cans three inches in diameter and six inches long. The ends of the cans are closed by perforated covers, which are attached by brass chains to the cylinder. The holes in the covers of the copper cans are protected from the entrance of dust and germs by a layer of absorbent cotton, and the pads are placed within these caps. These cans are then sterilized in the steam-pressure sterilizers. A number of the pieces of cotton waste are packed in a similar but slightly larger copper can (8×3 inches) and sterilized in the same manner; they are used as "sponges" at the confinements (Fig. 9).

The nail brushes which are used are inexpensive; the back is of wood and the "bristles" are wooden fibres. They are placed in copper boxes like those just described, but smaller ($3 \times 1 \times \frac{1}{2}$ inch), in which they are sterilized in the same manner. While in use the nail brush is kept in one of the basins of bichloride solution. The life of a nail brush under this treatment is about eight weeks. The scissors are sterilized at the time of using by being immersed in corrosive sublimate solution 1 to 2,000. The life of a pair of scissors is longer than one might expect—about one year

—under such treatment. The pelvimeter and scales are kept clean, but receive no special disinfection.

The Labor Bed.—All normal cases of labor are delivered on their own beds. The modified Kelly pad of rubber is used to protect the bed from the blood and discharges incident to the labor, and to protect the patient and the accoucheur's hands from the bed and bedding. In order to render the beds less infective, freshly laundered linen is spread whenever the patient possesses such a luxury. Sometimes it is possible to use an enamelled cloth under the bed sheet as a greater protection to the mattress; but it is often necessary to deliver the patient upon the dirtiest of bedding and in the most unsteady of double bedsteads. The side position is invariably insisted upon at the time of delivery, because it raises the patient's genitals from the bed and renders less likely uncleanliness both of the patient and of the attendant. This side position allows a better observation of the perineum during the birth, and permits the necessary exposure of the buttocks. At the same time more of the patient's shoulders and legs are covered than is possible in the dorsal posture.

Instrument Table.—It is usually impossible to find an aseptic surface to serve as an instrument table in the homes of our patients. The bedrooms are often so small that the bed takes up three-fourths of the floor space. It is our custom, therefore, to use the aseptic materials brought from the Hospital directly from the original packages, and never to spread them out on a table, which, although more convenient, would nullify the previous care given to their aseptic preparation. The douche bag is hung on some convenient hook, and the end of the douche tube is kept in the bag itself, immersed in the solution. The tape and scissors are laid upon the shallow basin, and the nail brush, when not in its proper case, is kept in the basin of antiseptic solution which is used for the hands. The linen for the eyes and that for the cord, the soap and vaseline, the cotton wipes and vulva pads, are used directly from their respective glass and copper receptacles. These basins and cans and bottles are placed on some table, or frequently a wooden chair is taken for an "instrument table."

The application of the principles of asepsis to the paraphernalia necessary to handle operative cases demands an extension of the methods just described. In all operative cases a larger number of persons must render their hands aseptic, and a greater amount of obstetric dressings must be used than at normal cases. The contents of the labor bag which is detailed to an operative case must be reinforced by additional cans of cotton wipes, by extra nail brushes and soap jars. It is our custom, also, to isolate the field of operation from surrounding sources of possible infection by wrapping the legs and covering the abdomen and the Kelly pad on which the patient lies with sterilized towels.

These towels are 26 by 15 inches in size. They are made of smooth huckaback, and finished by a simple hem at each end. Packages of six, wrapped and securely pinned in a seventh towel, are sterilized in the steam-pressure apparatus (Fig. 10). Patients are removed from their low beds after being anæsthetized and are brought into the largest and lightest room

Fig. 10.—Bundle of Sterilized Towels.

Fig. 11.—Perineorrhaphy Set in Glass Cylinder.

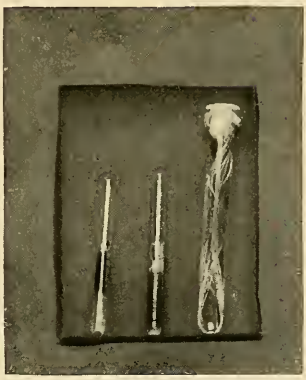

Fig. 12.—Suture Material.

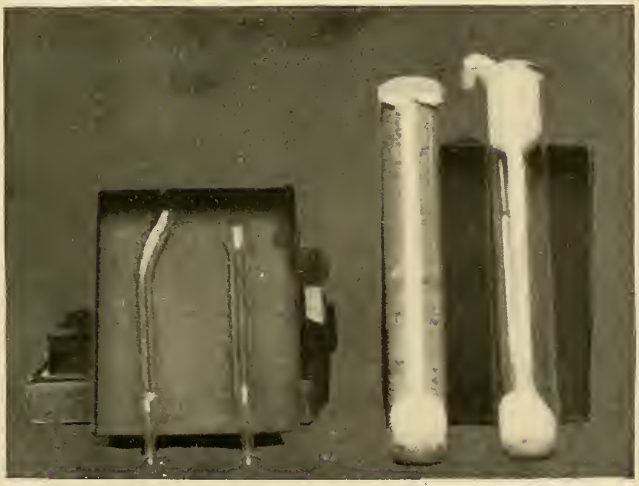

Fig. 13.—Vaginal and Intrauterine Douche Tubes. Glass Cylinders for Gauze or Tubes

their tenement affords; they are placed upon a table, and after the operation, again placed in their bed. These operating tables are improvised by covering a kitchen table with some old woollen comforter or blanket and placing the rubber Kelly pad on the end. Most operative deliveries are done while the patient is in the dorsal position. An instrument table is furnished by covering a small table with one of the sterilized towels.

The different operations require a longer or shorter list of instruments, which are sent from the Hospital in a sterile condition, in order to avoid the transportation of an instrument sterilizer, and to economize the expenditure of time. Sets of the necessary instruments for the minor operations of curettement and perineorrhaphy are kept in readiness for immediate use. Special preparation is necessary to prepare for a forceps operation or any more elaborate procedure.

The instruments and additional dressings are taken from the Hospital to the case in special operation bags, which are like the labor bags, but somewhat smaller.

A perineorrhaphy set consists of:

Three curved needles.	Needle holder.
Thumb forceps.	Scissors.
Two clamps.	Suture material.

The instruments are taken apart and wrapped in absorbent cotton, to prevent rusting; they are then packed in a glass cylinder, which is plugged with cotton, and the whole sterilized in the steam-pressure apparatus (Fig. 11). The suture material is either catgut for lesser operations, or silkworm gut for those of greater degree. The silkworm gut is sterilized by the Hospital by putting the strands in test tubes plugged with cotton and exposing it to steam under pressure for twenty minutes. These tubes are re-sterilized in the steam sterilizer each time they are opened for the removal of a portion of their contents. The catgut is prepared by a process of boiling in absolute alcohol after it has been soaked and washed in ether. Each strand is sealed in a separate glass tube immersed in absolute alcohol. The tube is broken, and, in order to soften it and render it more flexible, the catgut is wet in an aqueous solution of some antiseptic before using. Silk can be prepared in the same manner (Fig. 12).

All instruments are sterilized in the steam drums, except in the unusual cases, when a portable boiler is carried to the patient's home. The instruments are first wrapped in a towel and securely pinned; they are then exposed to the steam, and the bundle is not opened until they are needed. Such bundles, containing the obstetric forceps or the necessary outfit for curetting, are kept ready for use, at short notice, in the instrument case in the outdoor department laboratory. The curettement set consists of curettes, volsellum, vaginal speculum, cervical dilator, and intrauterine douche tube.

The woven silk bougie which is used for the induction of labor, and the catheter of the same material, with its metal stylet, used for replacing a prolapsed cord, are sterilized by scrubbing with soap, water, and nail brush,

followed by similar treatment with carbolic solution. These instruments are taken to the place of operation, wrapped in sterile gauze.

The more serious operations, such as craniotomy, symphysiotomy, and Cæsarean section have been performed successfully in this service. The aseptic preparation of apparatus requires a careful extension of these same principles. Soft rubber trays for instruments, and larger supplies of towels, jars of sterile water, and supplies of instruments from the indoor service are transported to the patient's home. Portable instrument sterilizers are often used on such occasions. Since the opening of the indoor service, patients requiring such severe operations are usually brought to the Hospital and operated upon there.

The lesser operations of catheterization, packing the vagina or the uterus with gauze, and the giving of enemata are of such frequent occurrence that the resident staff must be constantly ready to carry them out. The member of the house staff who is acting as instructor to the students on labor duty carries with him on his visits a bag which contains a nail brush, soap, and bichloride tablets for his hand washing, also a catheter, an enema syringe, and the instruments for packing the uterus.

The passing of a catheter is always done by sight, and never by touch alone. The labia majora are separated by one sterile hand, while the other first bathes the exposed vestibule with bichloride solution and then inserts the soft rubber catheter into the meatus and bladder. If a specimen of urine is wanted, it is caught and saved in the bottle which originally held the catheter. Of course this bottle must be rinsed free of the boracic acid solution before being used for the urine.

The instruments for packing the uterus are:

A uterine dressing forceps.

A volsellum.

A speculum.

A quantity of gauze in a glass cylinder.

The necessary instruments are wrapped in a towel and are then sterilized by the steam apparatus. The iodoform gauze is packed in one of the glass cylinders formerly used for the douche nozzles, and this is also exposed to the heat of steam under pressure. These cylinders are 11 by 1½ inches in size, and contain a strip of gauze twelve yards long and two inches wide.

The method of packing the vagina or uterus is to place the patient upon her back and across the bed; to insert a vaginal retractor; to grasp the anterior lip of the cervix with the volsellum and draw the uterus down until the os externum is in full view; then to introduce the gauze directly from its original glass receptacle into the uterus (Fig. 13). One hand of the operator holds the dressing forceps, and the other the volsellum. An assistant holds the retractor in one hand and the gauze receptacle in the other. The operation can be done aseptically without an assistant by employing a self-retaining speculum. The glass cylinder is held between the knees, or in the hand which holds the volsellum. If the uterus is to be packed, the first portion of the gauze is carried well up to the fundus, and the uterine cavity is filled gradually downward from the fundus. When the uterus is

fully packed, the vagina may be treated in like manner. The gauze is carried by the dressing forceps into the fornices of the vagina and packed around the cervix, then over the cervix; and, finally, the vagina is filled while the speculum is withdrawn slowly.

Bacteriological examinations of the various articles prepared in the manner described have been frequently made. The results of these tests have shown that the methods in use were efficient.

A recent report is given in detail:

Dressings from Obstetrical Bag, No. 18.

Bag had been on the shelf five days before examination.

Bacteriological examination:

Glass catheter, sterile.

Vaginal douche tube, sterile.

Nail brush, sterile.

Vulva pad, sterile.

Cotton, sterile.

Dry cord dressings, a gas producing bacillus in every way resembling bacillus coli communis.

Cord tape, sterile.

Starch, bacillus coli communis.

Silver nitrate solution (1 per cent.), sterile.

Eye wipes in boracic acid (saturated solution), sterile.

A subsequent examination of another sample of dry cord dressings showed these to be sterile.

An older report on one of the obstetric bags showed all articles sterilized by steam under pressure to be sterile. But articles not so treated, the rubber pad, cord tape, and cord dressings, which had been treated with milder measures, contained various species of staphylococci and bacilli. It was as a result of such reports from the bacteriologist that the sterilization by steam was extended to the treatment of nearly all the contents of the labor bag.

Asepsis of Accoucheur.

A prophylactic abstinence from contact with infectious matter of all kinds, and especially with infectious patients, is demanded of the medical attendants who give the routine care to the patients of this Hospital. The student, it is true, comes to the work from we know not what; but during his first twenty-four hours he is watched and directed during all his attempts to disinfect himself, and after that period he is under careful oversight, as outlined in another article in this report. From the time he comes on duty until his two weeks' service is finished, he cannot become infected from any work of the Hospital, and he is not allowed to undertake any other work of a medical nature.

In order to care for both normal and infected cases, the service is divided into a regular service and a septic service. If symptoms of a suspicious nature occur in any patient, she is isolated from the care of the student,

and is attended by the septic department, as described below. The resident staff of physicians do not come in contact with infectious cases, except in the earlier stages of suspected infection. As soon as a case develops fever and signs of infection, it is given into the hands of one particular member of the resident staff, who is detailed for septic work. He makes the routine postpartum calls, and carries out the treatment for all such cases under the direction of the septic attending physician. This septic subdivision of the service takes charge of all cases of conjunctivitis, of suppurating umbilicus, and of postpartum fever. The members of the resident staff perform this duty, serving in rotation for periods of one month each.

The attending physicians and their assistants are engaged in private practice as well as in the work of the Hospital. They cannot always be free from the care of private cases of a suspicious nature. These members of the Hospital staff, however, appreciate the particular need of extra care in their antiseptic precautions, and can be relied upon to disinfect their hands with an intelligent application of the routine procedures. The Hospital does not demand, even of its officers, however skilful in asepsis, that they do aseptic and septic work in its service at the same time. The attending physicians serve in rotation for periods of one month. During the month following their month of regular service, they become the septic attending physician. This officer and his assistant and the septic member of the resident staff form the septic department of the Hospital.

A further means of preventing infection is to limit the number of vaginal examinations in each case. A number of observers have recently claimed that normal labor should be conducted with no internal examination, and have presented series of cases so treated in whom a lower percentage of morbidity was observed than in similar cases where examinations were allowed. The percentage of fever, it is claimed, is proportional to the number of such examinations. The following list gives the published morbidity records of a number of institutions. In every case 100.4 degrees Fahrenheit (38 degrees Centigrade) is assumed as the limit of normal temperature.

Morbidity Statistics of Different Obstetric Schools.

Schools allowing students to examine the patients:

	Cases.	Fever from all Causes.
1. University Frauenklinik, Berlin, 1888–1895...	8,528..	25.5% (39.1%)
2. University Frauenklinik, Dorpat, 1888–1893 ..	889..	14.39%
3. University Obstetric Clinic, Prag, 1887–1895..	8,924..	13.54%
4. University Frauenklinik, Leipzig, 1896.....	595..	27.06%
5. Maison d'Accouchements Bandelocque, Paris, 1895	2,043..	19.18%
		Infection Fever.
6. University Frauenklinik (Poliklinik), Dorpat, 1893.....	1,250..	14.96%

	Cases.	Fever from all Causes.
7. University Frauenklinik, Würzburg.....	3,000..	9.2%
8. Königliche Frauenklinik (Dresden), 1893:		
a. no douche + examination	*a.* 71..	*a.* 4.3%
b. + douche + examination	*b.* 300..	*b.* 13.67%
c. + douche + examination	*c.* 419..	*c.* 18.3%

Series of cases conducted without internal examination :

	Cases.	Fever from all Causes.
9. University Frauenklinik, Leipzig, 1896	1,034..	25.26%
10. Königliche Frauenklinik, Dresden, 1893:		
a. no douche; no examination	*a.* 336..	*a.* 5.95%
b. + douche; no examination	*b.* 100..	*b.* 11.0%
c. + douche; no examination	*c.* 381..	*c.* 12.3%

1. Zur puerperalen Infection. Koblanck, Zeitschrift für Geburtshülfe und Gynækologie, 1896.

6, 2. Berichte und Arbeiten. O. Küstner, 1894.

3. Bericht über die Morbiditäts- und Mortalitäts-verhältnisse auf der Geburtshülflichen Klinik von Prof. Pawlik, etc., in Prag. Pipek, Monatschrift für Geburtshülfe und Gynækologie, 1896.

9, 4. Bakteriologie des weiblichen Genitalkanales. Menge und Krönig, 1897.

5. Fonctionnement de la Maison d'Accouchements Baudelocque. Lepage, 1896.

7. Die Verhütung des Kindbettfiebers in den geburtshilflichen Unterricht anstalten. Hofmeier, Klinische Vorträge, 1897.

8, 10. Untersuchung über die Entbehrlichkeit der Scheidenausspülungen bei ganz normalen Geburten und über die Sogenannte Selbstinfection. Leopold. Archiv für Gynækologie, 1894.

This agitation has had the beneficial effect of enlarging the field of external manipulation and of abdominal palpation. It is the custom of this Hospital to limit the indications for vaginal examination to the single rule that some good come of the proposed procedure. The Hospital demands of its pupils a report concerning the condition of the patient and the progress of the case at least every two hours. Each such report requires a vaginal examination to render it complete. The first object of this service is to teach, and it is the unanimous opinion of the Medical Board that a student must make frequent examinations of women in all stages of labor and pregnancy in order to learn to appreciate the normal and abnormal phases of any particular case. The students are not given an uncontrolled freedom to examine the patients, but are taught that frequent examination increases the danger of infection, and that one long examination is less dangerous than two short ones. They are taught also the advantage and practice of external examination. The table given above shows that the morbidity record of this Hospital compares favorably with that of any of the services which include a similar number of cases, whether the material is used for teaching purposes or not, and whether internal examination is limited, omitted, or practised freely.

The statistics concerning vaginal examinations have been recorded in a careful manner in a number of cases. These figures are detailed in the statistical synopsis of the patients. The summary shows that the pupils have made 27,693 examinations in the first stage of labor on 5,109 women, an average of over five examinations in each case. It shows, concerning the second stage of labor, that the pupils made 22,627 vaginal examinations on 5,843 cases, an average of nearly four examinations of each parturient woman. In spite of this extensive use of the material for instruction, the morbidity percentage is 12.26 per cent., and the mortality record of all cases dying of sepsis is 0.14 per cent.

The personal disinfection of the obstetrician involves the questions of dress and of hand washing. This Hospital does not furnish an operating gown for the use of those who conduct the normal cases of labor in the outdoor service, though a gown is sometimes worn when an operation of considerable importance is to be performed. On such occasions a gown of the annexed pattern is borrowed from the indoor service (Fig. 14). For the regular work, the accoucheur removes his coat and rolls up both shirt-sleeves above the elbow. The same preparation is made both to examine pregnant women, to attend those in labor, and to care for the postpartum cases. His remaining efforts are applied to the care needed to cleanse and prepare the hands.

The students are not allowed to attend the patients of this hospital when their hands are the seat of any suppurating wounds. The following details apply to the preparation of the hands of the attending physicians and other officers of the Institution. The care given to the hands at all times is an important element in rendering them easy of disinfection when desired. All wounds should be so treated that they will heal quickly. If small lesions suppurate and it is necessary for one to operate, the hands are rendered aseptic by cauterizing with liquefied carbolic acid and the use of extra precautions in cleansing. Slight wounds which are healing in a cleanly manner are protected from infection by a collodion dressing, which permits of the use of the disabled hand. The wound is first cleansed with bichloride solution and then covered with a solution of iodoform in ether. After this has evaporated, a very thin layer of absorbent cotton is placed over the wound and the whole surface is painted with collodion. This dries in the meshes of the cotton, and the whole mass makes a tough waterproof pellicle, which can be scrubbed with a nail brush without dislodging it and without irritation of the wound. The finger nails are the most difficult parts of the hand to be made aseptic, and their prophylactic care is of considerable importance. The fold of skin at the base of the nail and the reëntering angle under the free border demand the most attention. The best treatment for this fold of skin is to keep it pushed back from the nail and to remove all hang-nails and roughnesses. The polished surface of the nail is kept free from the thin epidermal layers which grow upon it from the basal fold. This is done by scraping the moistened finger with a sharp stick or quite dull metal point. Care is taken not to scratch the surface and thus make a lodging place for germs. The fold is pushed back several times a

Fig. 14.—Operating Gown.

day, when the hands are washed; and the scraping is done thoroughly, but not oftener than once in ten days. The free end of the nail is a natural dirt collector ; it is best cleaned by the use of a nail brush, soap and water, and subsequently of a soft wooden point. A soft towel or linen handkerchief is used for this purpose, pushing the cloth under the nail with a nail of the other hand. Metal scrapers are avoided, because they scratch the nail and make crevices which collect dirt more readily and render the nails more difficult of mechanical cleaning than they were before. The ideal condition is one in which the under surface and edge of the free end of the nail are as smooth and polished as the exposed surface. The following rules apply to all attendants, including the students:

Before beginning to disinfect the hands, any rings should be removed from the fingers, the coat should be laid aside, and the shirt-sleeves rolled up, as already described. The routine procedure of this Institution for preparing the hands is as follows:

1. Wash with hot water, green soap, and nail brush for at least three minutes.

2. Rinse in clear water, and remove from under the nail all visible dirt by means of a towel, handkerchief, or wooden point.

3. Wash again with a fresh supply of hot water, green soap, and nail brush for at least two minutes.

4. Rinse off the soap, and scrub the hands with a solution of bichloride of mercury of a strength of 1 to 2,000, using nail brush for at least three minutes.

5. While using the nail brush, the fingers are separated and particular attention is given to the nails.

6. The finger or hand is brought into contact with the female genitals while wet with the bichloride solution, and no lubricant is used.

In case the hands of the operator are known to have been recently infected, extra antiseptic precautions are used. A thorough scrubbing with brush and alcohol is interposed between procedures 3 and 4 on the list just given. This has been shown by a number of investigators to be very effective.* Sometimes a scrubbing in a solution of permanganate of potash, followed by a decolorizing wash in oxalic acid solution, is used between procedures 2 and 3 of the regular list. These extra procedures are used by the attending staff when they are conscious that they have been exposed to any infectious material.

The preservation of the hands in an aseptic condition after they have been prepared is a question of habit. A single touch by the hand of some unclean article may render the work of the past ten minutes entirely worthless. The habit of refraining from such contaminations is acquired only by continued practice. It is equally important that an operator may know when his aseptic hand has inadvertently touched some suspected article, be it some piece of furniture or some part of his own dress or of himself. It is not uncommon to have to stop some student from making an examination

* Versuche über die Desinfection der Hände. Poten. Monatschrift für Geburtshülfe und Gynækologie. 1895.

until he shall have resterilized his hand because he has handled the chair he will sit in or has readjusted his eye-glasses, or has done some equally unclean act.

Bacteriological examinations of the hands of students which have been prepared in this manner have given in certain cases rather unsatisfactory results. In one series of eight hands the cultures from one only remained sterile: six showed the presence of staphylococcus albus; and those from two showed the presence of staphylococcus citreus. During the period when this particular test was made, the outdoor service was running smoothly, and the cases were particularly free from infection and other fevers.

Asepsis of Patient.

The work of Döderlein* and Krönig† has proved that the normal secretion of the vagina will not only prevent the growth of pathogenic germs, but also destroy those artificially introduced. This Hospital treats its patients in accordance with this truth and submits them to no routine prophylactic antisepsis until labor has begun. Preventive treatment is applied, however, in special cases. All pregnant women who present any inflammation which could cause infection at time of labor are treated. Any suppurative disease in the region of the genital tract receives the necessary antiseptic treatment, and an effort is made to cure such local inflammations as early during pregnancy as possible. Inflammations of the vagina, bladder, urethra, vulva, and neighboring glands, whether gonorrhœal or septic in nature, require such interference. Abscesses are opened and dressed antiseptically. Vaginitis and cystitis are treated with disinfectant or astringent irrigation, and syphilis is treated by specific medication, both in the interest of the mother and of the child.

The regular bathing of the whole body and the proper regulation of the bowels are sadly neglected by the dwellers in New York tenements. In the outdoor service these lapses in the rules of ordinary hygiene must usually be corrected during or after labor. The application of aseptic principles in the outdoor department also meets with the practical limitation that a considerable number of our patients do not apply for aid until labor has begun. Those who may apply during pregnancy are thoroughly examined, and, if found to be healthy, they are protected from a subsequent "auto-infection" so-called, by the rules pertaining to vaginal examinations. Whenever internal examinations of pregnant women are made in this Hospital, the same precautions in cleansing the hands are enforced as when a case in labor is to be examined.

The routine preparation of a patient for normal labor is limited to external disinfection. As soon as the pupil arrives at the case, and before any physical examination is made, the vulva and the mons veneris, the anal region and perineum are washed with soap suds, water, and absorbent cotton; the same attention is given to the folds of the nates, the groins,

* Das Scheidensekret und seine Bedeutung für das Puerperalfieber. Döderlein, 1892.

† Bakteriologie des weiblichen Genitalkanales. Menge und Krönig, 1897.

the inner parts of the thighs, and the lower part of the abdomen. The hair of the labia majora and mons veneris is not cut in normal cases, except for special reasons (excessive length or matted dirt). The soap is washed off with clean water, and the whole region is rubbed with a cotton wipe and rinsed off with bichloride of mercury solution. If necessary, the vulva is held closed while the antiseptic solution is being poured over it. Such a disinfection is repeated, if the patient should have a passage from the bowels, or in prolonged labor, at intervals of six hours. The healthy internal genitals receive no antiseptic treatment whatever, and for two reasons: first, it is unnecessary, and, secondly, it does positive harm. The removal of mucus and the constringency of the vagina resulting from an efficient disinfection increase the liability to abrasions of the mucous membrane and to perineal lacerations. In cases where the vagina is already infected, a mechanical or chemical disinfection is rarely a possibility within the time limit of a first stage of labor, and the lesions resulting from a too free scrubbing will give the germs which may be present a better environment for their growth. Internal disinfection is a doubtful expedient after labor is begun, and has been discarded in our outdoor service.

The art of bringing the sterile hand into contact with the vagina after the patient has been washed is easily acquired. The hands are prepared as already described, and are introduced into the vagina while still wet with the bichloride solution, and without lubricant. The patient is exposed by some assistant sufficiently so that the vulva may be seen and the hands reach it without touching either bed clothes or patient's garments, thighs, or perineum. With the thumb and forefinger of one hand the labia majora are separated until the introitus vaginæ is seen. The fore and middle fingers of the other hand are placed in this opening and inserted into the vagina. The introduction of the finger into a vagina by touch alone, under the bed sheet, is a surgically unclean act.

During the final act of expulsion, the patient demands the constant attendance of the accoucheur. As already explained, the patient is placed on her left side, and the attendant controls the advance of the occiput and the stretching of the perineum with aseptic hands. The hands are rinsed frequently in the sublimate solution, and are brought into contact only with the vulva and perineum and with the neighboring parts which have been disinfected. As soon as the presenting part has reached the perineum, all reason for internal examination has ceased to exist. It is during this stage that frequent examinations and the introduction into the vagina of astringent chemicals will be especially liable to cause tears of the soft parts. The labor can be finished by external manipulations alone. The third stage of labor will frequently terminate spontaneously; if not, the delivery of the placenta may be effected by expression, after the manner known as that of Credé.

The immediate postpartum treatment consists of a hot vaginal douche of bichloride of mercury, 1 to 8,000. The fundus of the uterus is held for one hour before any abdominal bandage is applied. The external genitals are cleansed, with the antiseptic solution, of all visible blood stains, and a

vulva pad is placed on them. This vaginal douche is given as routine, not so much because of its antiseptic qualities, but because it lessens the chances of hæmorrhage from the uterus. The vulva pad used in the out-patient department is a small flat dressing, and cannot be described as in any sense an "occlusive antiseptic dressing." The pads must be loosened by the patients themselves whenever they pass urine; they collect a sample of the lochia for the instruction of the student attendant, and prevent only imperfectly the access of germs to the external genitals.

All patients are visited twice daily for three days after labor, and once daily after the third day until discharged. At these postpartum visits the student uses the same precautions for his personal disinfection that are required at the conduction of a labor. He washes the external genitals of the woman with absorbent cotton and antiseptic solution (bichloride of mercury, 1 to 2,000); he changes the vulva pads; he washes the child's mouth and eyes with boracic acid solution, and he dresses the stump of the umbilical cord or the umbilical wound with fresh gauze and sterilized starch powder. The rest of his duties are detailed elsewhere. They are concerned with the patient's general condition, and are not to be classified as "antisepsis." The internal genitals receive no douches or other routine treatment. The general rule that postpartum asepsis is limited exclusively to external cleanliness has no exceptions but for special cause.

In complicated labor the immediate antepartum preparation is usually more thorough than it is in normal cases. The external genitals receive a careful scrubbing with soap and water and nail brush, and the pudendal hair is cut short or even shaved. After such a scrubbing, the routine rinsing with corrosive sublimate solution is repeated. Such an antiseptic toilet is thorough enough to be distinctly painful, and is usually done after the patient is under the influence of an anæsthetic. Even in these operative cases, the internal genitals are not given any specific treatment, but all intravaginal and intrauterine manipulations are undertaken in or through the normal vagina.

The aseptic use of instruments during operations and the prevention of infection at the field of operation require, in a tenement-house service, a perfect familiarity with the environment on the part of every one who may take an active part in the proposed procedure. Whenever an operation is necessary in the outdoor service of this Hospital, the members of the attending and resident staffs alone take part in the active work; the pupils are deposed to the position of spectators, or, at most, to passive assistants, to hold a leg or douche bag. The instruments are spread out on the towels in which they were sterilized. The patient is anæsthetized and placed upon the improvised operating table. She is then subjected to the antiseptic preparation already described, and the field of operation is surrounded with the towels which were brought in a special sterilized bundle. The legs and feet, the upper part of the abdomen, and the table beneath the patient's buttocks are covered with these sterilized towels. All efforts are concentrated on these three elements—the operator, the patient, and the instruments—and the more remote surroundings are ignored entirely. The Hos-

pital is very particular to see that all patients receive plenty of good, nourishing food to assist them to recover from the strain of childbirth. A small diet kitchen, run in connection with the Hospital, is a great assistance to prevent a serious ending to many operative cases.

The immediate postpartum treatment of patients who have been operated upon is changed from that given the normal cases only in the addition of an intrauterine douche immediately after the delivery of the placenta. This douche acts as a stimulus to uterine contraction as much as it is an aseptic measure. The external genitals receive the same care as in routine cases. The postpartum care of operative cases presents practical peculiarities of asepsis in only a few cases. When the uterus has been packed with gauze, it is emptied, as a rule, within three days, or as soon as the woman's temperature and pulse would indicate an absorption of septic material. When a perineorrhaphy has been done, the patient may require catheterization at intervals of eight hours for two days or longer. Such cases may suffer from retention for a variable period, and they may not get out of bed because of the wound in the perineum, hence the catheterization may be required for a longer period. The stitches are removed from the perineal wound on the eighth to tenth day. The passing of a catheter in normal cases is a last resort and rarely needed. Such patients are allowed to sit up and empty the bladder without assistance. The aseptic method of passing a catheter as practised in this Hospital has been described above.

Morbidity Statistics.

The last Medical Report of this Hospital, published in 1893, contained a study of those cases of the preceding three years which were complicated by febrile symptoms. The following analysis is founded upon a six years' service in the Hospital's outdoor department, and includes the period covered by the report of 1893. The definition of fever which was arbitrarily assumed in that Report will be adhered to in this, and every rise of temperature above 100.4 degrees Fahrenheit is included as of pathological significance. The temperatures are all taken beneath the tongues of the patients by a self-registering thermometer, which is left *in situ* for a full five minutes.

During these six years the Hospital has treated 10,233 women in their homes, of whom 1,255 have presented a febrile complication; a total fever or morbidity percentage of 12.26 per cent. This is a better showing than was made in the 1893 Report, where this figure was noted as 15.81 per cent. This improvement is due in part to the fact that the early period of 1,454 cases described below now makes up a lesser part of the total number of cases. It is partly due also to improved methods of asepsis in handling this service. The six years are easily divided into three periods, according to the varying conditions of the service.

TABLE I.

THREE PERIODS OF SERVICE.

I. *January* 18, 1890, *to March* 1, 1892.

Patients admitted to treatment in all stages of puerperal period, whether infected or not. Service entirely out-patient; 1,454 cases gave 316 cases of fever, or 21.73 per cent.

II. *March* 1, 1892, *to February* 18, 1895.

Patients admitted to treatment only antepartum, or when, unattended in labor, they have applied within 12 hours of delivery. No postpartum infected cases taken. Service entirely out-patient; 6,456 cases gave 732 cases of fever, or 11.33 per cent.

III. *February* 18, 1895, *to April* 1, 1896.

Out-patient service the same as in the second period; but the indoor service was open, and many severer cases were transferred from the outdoor to the indoor service. The cases, therefore, in this period, have been less complicated than in second period; 2,323 cases gave 207 cases of fever, or 8.91 per cent.

The percentage given above for the first period differs from the same ratio as given in the last Report of the Hospital. Since the date of the last Report the original histories have been subjected to a careful review, with the result that a number of cases of fever of lesser degree have been discovered and added to the list. The morbidity percentage for the 1,454 cases of this period has been increased from 20.70 per cent. to 21.73 per cent. The difference in the percentages for the second and third periods, and the influence of the indoor service upon the morbidity percentage of the outdoor statistics, will be appreciated after a glance at the following table, which presents a list of the severer cases transferred from the latter service to the indoor wards.

TABLE II.

	Cases.
Manual dilatation and version for placenta prævia	3
Version for shoulder presentation	2
Decapitation for shoulder presentation	1
Craniotomy for contracted pelvis	1
Craniotomy for hydrocephalus	1
Forceps for posterior occipital position	1
Forceps for breech presentation	1
Postpartum case for endocarditis	1
Postpartum cases for eclampsia	2
Postpartum cases for rupture of uterus	2

In addition a number of cases which presented the possibility of operative procedure at the time of their application have been enrolled on the indoor books at once, without the formality of an outdoor service registry. The list just given represents the cases actually transferred after labor had begun. A number of primiparæ also have been transferred to the ward

service, which represents a combined primipara and operative service. The following table will demonstrate more clearly the percentage proportion of fever occurring in successive periods of the service. In this list the 10,233 cases are divided into series of 1,000 cases, and the number of fever cases and morbidity percentage for each period is appended:

TABLE III.

FEVER PERCENTAGES BY SUCCESSIVE 1,000 CASES.

First thousand,	209	cases of	fever,	or	20.9%
Second "	199	"	"		19.9%
Third "	160	"	"		16.0%
Fourth "	107	"	"		10.7%
Fifth "	85	"	"		8.5%
Sixth "	112	"	"		11.2%
Seventh "	83	"	"		8.3%
Eighth "	100	"	"		10.0%
Ninth "	92	"	"		9.2%
Tenth "	89	"	"		8.9%
233 cases	19	"	"		8.15%
10,233 cases	1,255	"	"		12.26%

The morbidity percentages thus obtained vary during the more recent periods between 8.3 per cent. and 11.2 per cent. These variations do not seem to follow any rule when viewed from this basis of successive series of one thousand cases. The influence upon the morbidity of using a maternity service for the instruction of medical students can be estimated in some measure from the following table. Most of our pupils are busy at their medical schools from October 1st to April 1st, and are comparatively free from required work during the summer six months. They come to this Hospital during the latter period to take the practical work in midwifery, which is for them an optional course. The twelve months can be divided, therefore, into two six-month periods, according to the number of pupils on duty. During the winter months the pupils are comparatively few in number, and the majority of the patients are cared for by the trained physicians on the house staff. During the summer months the patients are used for teaching purposes to their fullest possible extent.

In the following table the number of students on duty, the number of patients delivered, the number of fever cases occurring in these cases, and the morbidity percentage are given for the first period of nine months and for each six months' period thereafter, beginning with the date of opening of the outdoor service. This table shows plainly that the morbidity is not proportional to the number of students instructed, and therefore not to the use made of the service for their instruction. It shows the same influences at work as already pointed out in Table I., but it would seem to indicate, further, that the parturient woman was more susceptible to febrile complications during the cold months of the year. Such a fact would have been dwelt upon by earlier observers more than it will be by

the modern obstetrician, who thinks more of the sources of septic infection than of climatic influences. The reason for such a condition in this service can be found in the unhygienic dwellings and the herding of people in the Polish quarters of New York—factors which operate to supply our patients with poorer food and more vitiated air in winter than in summer, when fuel need not be purchased, and when all the windows may be kept constantly open. The fact remains that there is more fever among our patients during the winter months, when the sources of infection are diminished in number, than during the warm weather, when the clinical material is used for instruction purposes to the fullest possible extent.

TABLE IV.

RELATION OF NUMBER OF STUDENTS TO PERCENTAGE OF FEVER.

Period.	No. Students.	No. Cases.	No. Fever Cases.	Per Cent.
Jan. 8, 1890, to Sept. 30, 1890, 9 months....	53	130	25	19.23
(Jan. 8th to Mar. 31st only 15 cases treated.)				
Oct. 1, 1890, to Mar. 31, 1891, 6 months....	62	201	49	24.37
April 1, 1891, to Sept. 30, 1891, "	145	470	96	20.42
Oct. 1, 1891, to Mar. 31, 1892, "	140	819	176	21.48
April 1, 1892, to Sept. 30, 1892, "	204	1,046	176	16.82
Oct. 1, 1892, to Mar. 31, 1893, "	105	1,071	130	12.13
April 1, 1893, to Sept. 30, 1893, "	143	1,144	95	8.30
Oct. 1, 1893, to Mar. 31, 1894, "	60	1,025	114	11.12
April 1, 1894, to Sept. 30, 1894, "	206	1,331	121	9.09
Oct. 1, 1894, to Mar. 31, 1895, "	77	831	80	9.62
April 1, 1895, to Sept. 30, 1895, "	224	970	88	9.07
Oct. 1, 1895, to Mar. 31, 1896, "	126	1,195	105	8.78
Totals, 6 years 3 months	1,545	10,233	1,255	12.26

The following tables of the presentations and of the operations done in the service during the period reported upon, reproduce the figures from the statistical synopsis, and will give a clear appreciation of the character of the service.

TABLE V.

TABLE OF PRESENTATIONS.

Vertex	8,495 cases, or 94.71% of observed cases.					
Face, 36 Brow, 4	42	"	"	0.47%	"	"
Ear, 2						
Breech.....	341	"	"	3.80%	"	"
Shoulder.....	91	"	"	1.02%	"	"

TABLE VI.

TABLE OF OPERATIONS AND SEVERER COMPLICATIONS.

Placenta prævia	31	cases,	or	0.30%	of	all	cases.	
Eclampsia	14	"	"	0.13%	"	"		
Abortions	417	"	"	4.07%	"	"		
Forceps	294	"	"	2.99%	"	"	omitting	abortions.
Version	212	"	"	2.16%	"	"	"	"
Perforation and decapitation	5	"	"	0.05%	"	"	"	"
Symphysiotomy	6	"	"	0.06%	"	"	"	"
Cæsarean section	2	"	"	0.02%	"	"	"	"
Manual extrac.of placenta,	182	"	"	1.95%	"	"	"	"

It is an accepted fact that primiparæ are more liable to febrile complications after labor than multiparæ are, and it is of interest to note in this connection that there were 2,157 primiparæ out of 10,094 cases in whom the number of the parturiency was noted. This is a percentage of 21. Of the 1,255 cases presenting febrile symptoms, 403 were primiparæ and 852 were multiparæ. The 2,157 primiparæ represent only 21 per cent. of all cases, but furnish 403 fever cases, which is 32.11 per cent. of all fever cases. These 403 fever cases represent 18.68 per cent. of all primiparæ, and the 852 fever cases occurring in multiparæ represent only 10.54 per cent. of all multiparæ. These figures mean that the ratio 10.54 to 18.68, or 1 to 1.77, represents the relative frequency of postpartum fever in multiparæ and primiparæ. This ratio is given by Kleinwächter as 3.7 to 6.8, or 1 to 1.83, which is nearly identical with the above result.

It has been decided to divide the 1,255 cases which present febrile complications according to their prominent etiological factor into seven classes similar to those adopted in the last Medical Report. This has been done in the following table:

TABLE VII.

CLASSIFICATION OF FEVER CASES ACCORDING TO CHIEF CAUSES.

	Cases.	Of fever cases.	Of all cases.
Class I. Breast temperatures	171	13.63%	1.67%
Class II. Constipation temperatures	276	21.99%	2.70%
Class III. Combinations of I. and II.	90	7.17%	0.88%
Class IV. Puerperal infection	331	26.38%	3.23%
Class V. Complications which are not puerperal sepsis and not included in Classes I. to IV.	82	6.53%	0.80%
Class VI. Single rise of temperature on labor day	162 (217)	12.91% (17.29%)	1.58% (2.12%)
Class VII. Temperatures of unknown origin	143	11.39%	1.40%

Class I. Cases in which the Breasts were Hard and Tender, and the Temperature Became Normal upon Relief of this Condition.

As recorded in Table VII. there were 171 cases. To these cases there must be added one case of abscess of the breast, in which the abscess followed a cured uterine sepsis.

Analysis of the 172 Cases of Breast Temperature.

Table VIII.

TABLE OF MAXIMUM TEMPERATURES.

	Cases.
Maximum temperature between 100.5° and 101.4°	83
" " " 101.5° " 102.4°	41
" " " 102.5° " 103.4°	28
" " " 103.5° " 104.4°	17
" " " 104.5° " 105.4°	3

Table IX.

TABLE OF NUMBER OF DAY POSTPARTUM OF ONSET OF FEVER.

	Cases.
Fever began on 1st day postpartum	9
" " 2d " "	15
" " 3d " "	39
" " 4th " "	29
" " 5th " "	20
" " 6th " "	16
" " 7th " "	12
" " 8th " "	13
" " 9th " "	7
" " 10th " "	4
" " 11th " "	6
" " 21st " "	1
" " 32d " "	1

Table X.

TABLE OF DURATION OF TEMPERATURE.

	Cases.		Cases.
Fever lasted 1 day	110	Fever lasted 5 days	6
" " 2 days	25	" " 6 "	1
" " 3 "	19	" " 7 "	2
" " 4 "	8	" " 8 "	1

Of these 172 cases of temperature due to changes in the breasts, 12 developed an abscess. To these 12 cases, 9 other cases of abscess of the breast must be added, in 8 of which the abscess formation was not accompanied by any febrile symptoms, and 1 case in which the abscess of the breast was pyæmic in character. These 21 cases of purulent inflammation of the mammary gland make up only 0.2 per cent. of the total number of cases treated. This number is reduced to 0.15 per cent. if we remove from the total 21 the pyæmic case and 4 other cases which originated from an infection of the nipples before labor began.

The following table gives some interesting facts concerning these cases:

Table XI.

	Began Ante-partum.	Began Post-partum.	Presented other Causes of Fever.	Primipara.	Multipara.	Right Breast.	Left Breast.
Abscesses without fever.	2	6	4	3	5	4	4
" with fever....	2	10	1	3	9	6	6
Pyæmic abscess.....	0	1	1	0	1	0	1
Totals	4	17	6	6	15	10	11

Class II. Cases in which the Bowels were Constipated, and the Temperature Became Normal upon the Exhibition of Cathartics.

There are 276 cases which come under this heading.

Analysis of the 276 Cases of Constipation Temperature.

Table XII.

table of maximum temperatures.

	Cases.
Maximum temperatures between 100.5° and 101.4°.....	139
" " " 101.5° " 102.4°.....	82
" " " 102.5° " 103.4°.....	37
" " " 103.5° " 104.4°.....	16
" " " 104.5° " 105.4°.....	2

Table XIII.

table of number of day postpartum of onset of fever.

	Cases.
Fever began on 1st day postpartum	52
" " " 2d " "	52
" " " 3d " "	69
" " " 4th " "	40
" " " 5th " "	23
" " " 6th " "	19
" " " 7th " "	5
" " " 8th " "	7
" " " 9th " "	3
" " " 10th " "	3
" " " 11th " "	1
" " " 14th " "	1
" " " 15th " "	1

Table XIV.

TABLE OF DURATION OF TEMPERATURE.

	Cases.		Cases.
Fever lasted 1 day	197	Fever lasted 4 days	9
" " 2 days	49	" " 5 "	2
" " 3 "	17	" " 8 "	2

Class III. Cases in which Both the Breasts and the Condition of the Bowels Demanded Treatment, and the Temperature Became Normal upon Relieving These Conditions.

There are 90 cases of which this statement is true.

Analysis of the 90 Cases of Combined Breast and Bowel Temperatures.

Table XV.

TABLE OF MAXIMUM TEMPERATURES.

	Cases.
Maximum temperature between 100.5° and 101.4°	26
" " " 101.5° " 102.4°	37
" " " 102.5° " 103.4°	17
" " " 103.5° " 104.4°	7
" " " 104.5° " 105.4°	3

Table XVI.

TABLE OF NUMBER OF DAY POSTPARTUM OF ONSET OF FEVER.

	Cases.
Fever began on 1st day postpartum	11
" " " 2d " "	11
" " " 3d " "	20
" " " 4th " "	12
" " " 5th " "	9
" " " 6th " "	11
" " " 7th " "	6
" " " 8th " "	6
" " " 9th " "	1
" " " 10th " "	1
" " " 11th " "	2

Table XVII.

TABLE OF DURATION OF TEMPERATURE.

	Cases.		Cases.
Fever lasted 1 day	44	Fever lasted 4 days	7
" " 2 days	20	" " 5 "	5
" " 3 "	11	" " 6 "	3

CLASS IV. CASES IN WHICH THE TEMPERATURE SEEMED TO BE DUE TO THE ACTION OF MICRO-ORGANISMS WHICH HAD INVADED THE BODY THROUGH THE PARTURIENT WOUNDS.

There are 331 cases of puerperal infection, which give the following analysis tables:

ANALYSIS OF THE 331 CASES OF SEPTIC INFECTION.

TABLE XVIII.

TABLE OF MAXIMUM TEMPERATURES.

	Cases.
Maximum temperatures between 100.5° and 101.4°	56
" " " 101.5° " 102.4°	66
" " " 102.5° " 103.4°	64
" " " 103.5° " 104.4°	72
" " " 104.5° " 105.4°	57
" " " 105.5° " 106.4°	14
" " " 106.5° " 106.9°	2

TABLE XIX.

TABLE OF NUMBER OF DAY POSTPARTUM OF ONSET OF FEVER.

	Cases.
Fever began on labor day	60
" " " 1st day postpartum	56
" " " 2d " "	49
" " " 3d " "	48
" " " 4th " "	41
" " " 5th " "	20
" " " 6th " "	19
" " " 7th " "	8
" " " 8th " "	8
" " " 9th " "	8
" " " 10th " "	5
" " " 11th " "	4
" " " 12th " "	1
" " " 13th " "	3
" " " 14th " "	1

These 331 septic cases may be divided into two groups—those which remained in the care of the Hospital until the end of the disease, and those which sought other attendance during their illness. Of the first class, 272 recovered and 9 died; 37 cases sought the aid of outside physicians; the results in 34 are doubtful; 3 others have been traced, and the final result recorded in the histories. The remaining 13 were transferred to other hospitals and their record is given below.

The tables of duration of temperature are given separately for each subdivision.

Table XX.

TABLE OF DURATION OF TEMPERATURE IN 272 CASES OF GROUP I. WHICH RECOVERED.

	Cases.		Cases.
Fever lasted 1 day.....	60	Fever lasted 9 days.....	4
" " 2 days.....	47	" " 10 "	5
" " 3 "	38	" " 11 "	1
" " 4 "	42	" " 12 "	2
" " 5 "	25	" " 13 "	2
" " 6 "	18	" " 15 "	6
" " 7 "	12	" " 19 "	2
" " 8 "	7	" " 30 "	1

Table XXI.

TABLE OF DURATION OF TEMPERATURE OF 9 CASES OF GROUP I. WHICH DIED.

	Cases.		Cases
Fever lasted 3 days.....	2	Fever lasted 8 days.....	1
" " 5 "	2	" " 11 "	1
" " 6 "	1	" " 35 "	1
" " 7 "	1		

Table XXII.

TABLE OF THE OBSERVED DURATION OF TEMPERATURE IN 37 CASES OF GROUP II. WHO CALLED IN OTHER PHYSICIANS.

	Cases.		Cases.
Fever observed 1 day.....	3	Fever observed 6 days.....	3
" " 2 days.....	4	" " 7 "	2
" " 3 "	10	" " 8 "	1
" " 4 "	9	" " 9 "	2
" " 5 "	2	" " 12 "	1

Of the 13 cases referred to other hospitals for treatment, 9 recovered and 4 died. The duration of fever in these cases is shown in the following table:

Table XXIII.

STATEMENT OF OBSERVED DURATION OF TEMPERATURE IN 13 CASES OF GROUP II. TRANSFERRED TO OTHER HOSPITALS.

Fever was observed for two days in two cases, for five days in two cases, and for six, seven, eleven, thirteen, and twenty-one days respectively in one case each; these nine recovered. Fever was observed for six days in three cases, and for seventeen days in one case; these four died in hospital.

A more detailed analysis is given below concerning the fatal cases.

CLASS V. CASES IN WHICH THE TEMPERATURE WAS EVIDENTLY DUE TO SOME COMPLICATING PATHOLOGICAL CONDITION OTHER THAN A PUERPERAL SEPTICÆMIA.

There are 82 such cases in the series under consideration, and they may be grouped as follows :

ANALYSIS OF THE 82 CASES OF COMPLICATING DISEASES.

TABLE XXIV.

GROUP I. NON-SEPTIC DISEASES.

	Cases.		Cases.
Pneumonia	16	Phthisis	11
Epidemic influenza without pneumonia	4	Malaria	3
Bronchitis	16	Intestinal colic	2
Dry pleurisy	1	Alcoholism	1
		Starvation	1

GROUP II. SEPTIC DISEASES OF NON-PUERPERAL ORIGIN.

	Cases.		Cases.
Facial erysipelas	4	Cellulitis of wrist	1
Cystitis	1	Burns from douche and hypodermic abscess	1
Abscess of gluteal region	1	Tonsillitis	4
Abscess of thigh	1		

GROUP III. PUERPERAL DISEASES OF NON-SEPTIC ORIGIN.

	Cases.
Eclampsia	8
Suppression of urine after ether	1
Retention of urine	1
Anæmia after hæmorrhage	4

To these there should be added one case of phthisis who died without presenting febrile symptoms, one case of tonsillitis in a patient who had previously been cured of a puerperal sepsis, and ten cases of pneumonia which complicated septic processes.

Adding these duplicate or additional cases, the following list gives the corrected statistics:

	Cases.
Pneumonia	26
Phthisis	12
Tonsillitis	5

CLASS VI. CASES IN WHICH A SINGLE RISE OF TEMPERATURE OCCURRED DURING OR IMMEDIATELY AFTER DELIVERY.

There are 162 cases in this subdivision of the subject, but there are 55 other cases which presented a similar rise during or immediately after labor, and also a subsequent temperature due to some other cause. These 217

cases are grouped for purposes of statistics. Sixty additional cases presented a temperature on the day of delivery which was due to a true septicæmia: these are considered under Class IV. only.

The etiological factor in this class of cases is, that labor is accompanied by an increased muscular exertion, with a diminished activity of the lungs and skin.*

Analysis of the 217 Cases of Labor Day Temperatures.

Table XXV.

TABLE OF CAUSES OF SECOND FEVER IN 55 ADDITIONAL CASES.

	Cases.
Fever due to breasts	11
" " constipation	20
" " both breasts and bowels	10
" " sepsis	7
" " unknown causes	7

Table XXVI.

TABLE OF HEIGHT OF TEMPERATURE.

	Cases.
Temperature between 100.5° and 101.4°	182
" " 101.5° " 102.4°	30
" " 102.5° " 103.4°	3
" " 103.5° " 104.4°	2

Class VII. Cases in which no Accountable Cause for the Temperature was Obvious.

There are 143 cases of this class.

Analysis of the 143 Cases of Temperature of Unknown Origin.

Table XXVII.

TABLE OF MAXIMUM TEMPERATURES.

	Cases.
Maximum temperature between 100.5° and 101.4°	90
" " " 101.5° " 102.4°	41
" " " 102.5° " 103.4°	10
" " " 103.5° " 104.4°	2

Table XXVIII.

TABLE OF DURATION OF TEMPERATURE.

	Cases.
Fever lasted 1 day	118
" " 2 days	20
" " 3 "	1
" " 4 "	3
" " 5 "	1

* Fieber in der Geburt., Winter. Zeitschrift für Geburtshülfe und Gynækologie, xxiii

Table XXIX.

TABLE OF DAYS OF PUERPERIUM ON WHICH RISE OF TEMPERATURE OCCURRED.

Cases with temperature on one day only, total 118.

	Cases.
Rise of temperature occurred on 1st day postpartum	31
" " " " " 2d " "	9
" " " " " 3d " "	15
" " " " " 4th " "	14
" " " " " 5th " "	17
" " " " " 6th " "	7
" " " " " 7th " "	14
" " " " " 8th " "	6
" " " " " 9th " "	2
" " " " " 10th " "	2
" " " " " 13th " "	1

Cases with temperature on two days, total 20.

	Cases.
Rise of temperature occurred on labor day and 1st day postpartum	5
" " " " " " " " 8th " "	1
" " " " " 1st and 2d days	1
" " " " " 1st " 5th "	2
" " " " " 2d " 3d "	2
" " " " " 2d " 8th "	1
" " " " " 3d " 4th "	3
" " " " " 3d " 5th "	2
" " " " " 3d " 8th "	1
" " " " " 5th " 6th "	1
" " " " " 5th " 7th "	1

Case with temperature on three days, total 1.

Rises of temperature occurred on labor day, 1st and 3d days postpartum.

Cases with temperature on four days, total 3.

Rises of temperature occurred on 1st, 2d, 3d, 4th days postpartum in 1 case.

Rises of temperature occurred on 1st, 2d, 3d, 9th days postpartum in 1 case.

Rises of temperature occurred on 3d, 4th, 5th, 6th days postpartum in 1 case.

Case with temperature on five days, total 1.

Rises of temperature occurred on 2d, 3d, 4th, 5th, 6th days postpartum.

Mortality Statistics.

The total mortality among the 10,233 cases amounts to 42 cases. This is a total mortality percentage of 0.41 per cent. Another death must be added to this list, although it did not occur in one of the 10,233 deliveries.

This patient died of advanced cardiac disease in the early part of the seventh month of pregnancy. If this case be included in estimating the ratio, this is not materially altered, but is simply increased to 0.42 per cent.

If these deaths are tabulated in accordance with the subdivision of the service as recorded in Table I., page 236, the following table results:

Table XXX.

	No. of Cases.	No. of Deaths from Sepsis.	Pr. Ct.	No. of Deaths from all Causes.	Pr. Ct.
1st Period.					
Jan., '90–Mar., '92	1,454	8	0.48%	14	0.96%
2d Period.					
Mar., '92–Feb., '95	6,457*	5	0.07%	26	0.40%
3d Period.					
Feb., '95–Apr., '96	2,323	2	0.08%	3	0.12%
Totals.....	10,234	15	0.14%	43	0.42%

The mortality percentages in each successive thousand cases is shown in the following table:

Table XXXI.

	No. of Deaths from Sepsis.	Per Cent.	No. of Deaths from all Causes.	Per Cent.
First Thousand.....	6	0.6%	10	1.0%
Second "	2	0.2%	6	0.6%
Third "	0	0.0%	2	0.2%
Fourth "	0	0.0%	5	0.5%
Fifth "	0	0.0%	3	0.3%
Sixth "	3	0.3%	8	0.8%
Seventh "	0	0.0%	2	0.2%
Eighth "	2	0.2%	3	0.3%
Ninth "	1	0.1%	1	0.1%
Tenth "	0	0.0%	0	0.0%
233 cases.....	1	0.4%	2	0.8%
Antepartum case....	0	0.0%	1	....
10,234 cases	15	0.14%	43	0.42%

These percentages are subject to the criticism that certain of our cases sought other assistance after becoming ill, and may have died subsequently from the effects of the puerperal infection. Fifty patients are of this class, but of these thirteen were sent to other hospitals, and the results in all are

* The antepartum death from heart disease is added to this series.

TABLE XXXIV.—CHART OF FATAL CASES.

Number of Deaths.	Confinement Number.	Cause of Death.	Age.	Para.	Month of Gestation.	Presentation.	Position.	Examined by	First Attended by the Hospital.	Complications Before Labor.	Character of Labor.	Character of Puerperium	Onset and Course of Fever.	Day of Death.
1	330	Uræmia	33	VIII.	?	Shoulder	?	Midwife; Hospital	Intrapartum		Podalic version.	Albuminuria; cardiac weakness.	None	1st day postpartum.
2	1,425	"	34	V.	9	Vertex	R. O. A.	Hospital	Antepartum	Œdema of lungs	Normal	Œdema of lungs	None	4th " "
3	2,381	Eclampsia	24	I.	9	Vertex; Breech	L. O. A.; ?	"	"	Eclampsia	Twins; low forceps, breech extraction.	Eclampsia; fever	Had fever when first seen, during labor, until death.	1st " "
4	3,564	"	21	I.	9	Vertex	R. O. P.	"	"	"	Low forceps	"	Had fever during labor; continued till death	1st " "
5	4,055	"	22	I.	9	Vertex; Breech	R. O. A.; R. S. A.	"	"	"	Twins; forceps; breech extraction.	"	Had fever during labor; continued till death.	2d " "
6	4,683	"	24	II.	8½	Vertex	L. O. A.	"	"	Albuminuria	Manual dilatation of cervix; high forceps.	Eclampsia	None	Labor day.
7	5,633	Uræmia	19	I.	9	"	"	"	"	Deformed pelvis	High forceps	Albuminuria; fever	Had fever during labor; continued till death.	1st day postpartum.
8	6,235	Eclampsia	30	II.	9	Vertex; Vertex	L. O. A.; R. O. P.	"	"	Eclampsia	Twins; podalic version (twice).	Eclampsia; fever	Had fever during labor; continued till death.	Labor day.
9	6,925	Uræmia	21	II.	8	?	?	Physician; Hospital	Intrapartum	Albuminuria	Normal	Albuminuria; cardiac weakness.	None	1st day postpartum.
10	7,070	Eclampsia	20	II.	9	Vertex	L. O. A.	Hospital	Antepartum	Eclampsia	Accouchement forcé; podalic version.	Eclampsia; fever.	Had fever during labor; continued till death.	1st " "
11	10,218	"	35	IV.	9	Vertex; Breech	R. O. A.; L. S. A.	"	"	Albuminuria	Twins; labor easy	Eclampsia	None	Labor day.
12	4,726	Purpura hæmorrhagica	22	III.	9	Vertex	L. O. A.	"	"	Hæmorrhage from mouth and uterus.	Forceps	Hæmorrhage; shock	"	1st day postpartum.
13	5,473	Postpartum hæmorrhage	38	XII.	7	"	"	"	"	None	Induction of labor; podalic version.	Hæmorrhage; shock	"	1st " "
14	349	Placenta prævia	34	II.	8½	Shoulder	?	"	"	Hæmorrhage	Podalic version	Œdema of lungs	"	3d " "
15	3,592	"	30	VII.	9	"	L. Scap. A.	"	"	"	"	Shock	"	Labor day.
16	760	Hæmorrhage; carcinoma of cervix.	27	V.	9	"	R. Scap. A.	"	"	"	Podalic version; forceps to after-coming head.	Hæmorrhage; shock	"	" "
17	2,429	Exhaustion: Starvation; Hæmorrhage	35	II.	9	Vertex	L. O. A.	"	"	Concealed hæmorrhage		Inanition; fever	Began during labor, and continued 48 hours.	7th day postpartum.
18	426	Probable rupture of uterus	?	IX.	9	Shoulder	?	Midwife; Physician; Hospital	Intrapartum		Impacted shoulder; podalic version.	Shock	None	Labor day.
19	1,198	Rupture of uterus	30	VI.	5½	Vertex	?	Physician; Hospital	"	Hæmorrhage	Placenta prævia; podalic version.	"	"	2d day postpartum.
20	3,267	" " "	34	VII.	9	"	L. O. A.	Midwife; Hospital	"	"	Fœtus and placenta delivered from abdomen through lacerated uterus.	"	"	1st " "
21	3,314	" " "	23	II.	8	"	R. O. P.	Hospital	Antepartum	Pendulous abdomen	Posterior position; severe contractions.	"	"	4th " "
22	1,723	Pneumonia	38	VI.	7	"	L. O. A.	"	"	None	Duration, 27 hours	Pneumonia; fever	Began labor day; continued till death.	7th " "
23	5,824	"	35	III.	9	Shoulder	L. Scap. A.	"	"	Alcoholism	Podalic version.	Pneumonia; fever	Began 2d day, continued till death.	10th " "
24	3,351	Phthisis	32	I.	9	Vertex	R. O. P.	"	"	Cough hæmoptysis	Duration, 8 hours	Œdema of lungs	None	Labor day.
25		Heart disease	23	I.	7			"	"	Dyspnœa; cardiac arythmia			"	Died antepartum.
26	5,955	Suppression of urine from ether.	35	V.	9	Breech	?	"	Intrapartum	Uterine fibroid in cervix	Cæsarean section.	Suppression of urine; fever.	Began 2d day; continued till death.	2d day postpartum.
27	1,547	Facial erysipelas	?	?	?	? Breech	? R. S. A.	"	"	Facial erysipelas	Twins	Facial erysipelas	Had fever when first seen, during labor.	1st " "
28	5,708	Surgical kidney	34	IX.	9	Vertex	L. O. A.	Physician; Hospital	"	Deformed pelvis	High forceps	Vesico-vaginal fistula; fever	Had fever when first seen, during labor; continued till 7th day; duo to sepsis.	Seventh month postpartum.
29	161	Septicæmia	28	III.	8	"	R. O. A.	Hospital	Antepartum	Gonorrhœa; vulvo-vaginal abscess.	Postpartum hæmorrhage	Pneumonia; fever	Began 2d day, and continued till death.	11th day postpartum.
30	205	"	28	II.	9	?	?	Midwife	Postpartum			Pneumonia; fever; Pyæmic abscesses; hæmatemesis.	Had fever when first seen, 6th day; continued till 30th day; irregular low fever 38 to 40 days.	40th " "
31	300	"	28	I.	?	?	?	"	"			Fever	Had fever when first seen, on 3d day; continued till death.	5th " "
32	420	"	24	I.	9	Vertex	R. O. A.	Hospital	Antepartum	None	Podalic version; hydrocephalus; deep lacerations.	Fever	Began 2d day; continued till death.	6th " "
33	804	"	40	VI.	9	Breech	R. S. A.	"	"			Pyæmic abscesses; fever	Began 9th day; continued till discharge, 15th day.	22d " "
34	995	"	25	V.	9	?	?	Midwife	Postpartum			Acute pulmonary tuberculosis; fever	Had fever when first seen, 1st day postpartum; continued till discharge, 8th day.	25th " "
35	1,016	"	35	VII.	9	Vertex	R. O. A.	Hospital	Antepartum	None	Normal	Acute diffuse nephritis; fever.	Began 1st day, and continued till death.	6th " "
36	1,093	"	35	X.	9	?	?	Midwife	Postpartum			Pneumonia; fever	Had fever when first seen, 2d day; continued till death	6th " "
37	5,190	"	36	VI.	9	Vertex	L. O. A.	Hospital	Antepartum	None	Normal	Fever	Began 3d day; continued till discharge, 10th day.	Unknown
38	5,686	"	26	VIII.	9	Shoulder	R. Scap. A.	"	"	"	Podalic version.	Pneumonia; fever	Began 4th day, and continued till death.	12th day postpartum.
39	5,709	"	24	III.	9	Vertex	L. O. A.	"	Intrapartum	Cardiac disease	Podalic version; postpartum hæmorrhage.	Albuminuria; pneumonia; fever.	Began during labor; continued till discharge, 11th day.	25th " "
40	7,263	"	41	XV.	9	"	R. O. A.	"	"		Podalic version; rupture of uterus.	Fever	Began 1st day; continued till death.	6th " "
41	7,538	"	35	V.	9	"	"	"	"			Pyæmic abscesses; fever	Began during labor; continued till discharge, 7th day.	10th " "
42	8,034	"	39	XIII.	9	"	?	"	Antepartum	Albuminuria; hæmorrhage	Placenta prævia; podalic version; accouchement forcé.	Fever	Began during labor; continued till death.	2d " "
43	10,047	"	30	II.	9	"	L. O. A.	Midwife; Hospital	Intrapartum	Deformed pelvis	Podalic version; accouchement forcé.	Vulvar abscess; fever.	Began 3d day; continued till discharge, 8th day.	23d " "

known and included in these statistics. Four of the thirteen died. Thirty-seven cases sought the care of private physicians. The hospital has traced three of these; one recovered and two died, and are included in our records (C. N. 5,799, C. N. 7,538). The records also include a case of surgical kidney following cystitis and vesico-vaginal fistula, who died many months after her discharge from the service. The remaining thirty-four patients who sought other medical care were discharged while still septic, but the severity of their sepsis varied very materially. It is safe to infer that a large majority of them recovered. The following table gives their temperatures at the time of discharge:

Table XXXII.

TEMPERATURE AT TIME OF DISCHARGE OF 34 CASES SEEKING OTHER MEDICAL ATTENDANCE.

Temperature at time of discharge below 100.5°	3
" " " " " between 100.5° and 101.4°	5
" " " " " " 101.5° " 102.4°	6
" " " " " " 102.5° " 103.4°	11
" " " " " " 103.5° " 104.4°	5
" " " " " above 104.5°	4

If all these cases are included as deaths, the total mortality would be 77 fatal cases in 10,233 cases, or 0.75 per cent. Of course this is manifestly an over-estimate; nevertheless even this figure compares favorably with the figures of other obstetric schools.

Table XXXIII.

MORTALITY PERCENTAGES OF VARIOUS SCHOOLS.

	Cases.	Mortality.
1. University Frauenklinik, Berlin, 1888–95	8,528	1.93%
2. Maison d'Accouchements Baudelocque, Paris, 1890–95	10,861	0.66%
3. University Obstetric Clinic, Prag, 1887–95	8,924	0.85%
4. University Frauenklinik, Dorpat, 1888–93	889	1.57%
5. University Frauenklinik Poliklinik, Dorpat	1,267	2.2%
6. University Frauenklinik, Würzburg	3,000	0.7%

1. Zur puerperalen Infection. Koblanck, Zeitschrift f. Geburtshülfe und Gynækologie, 1896.

2. Fonctionnement de la Maison d'Accouchements Baudelocque. Lepage, 1896.

3. Bericht über die Morbiditäts-verhältnisse, etc. Pipek, Monatschrift für Geburtshülfe und Gynækologie, 1896.

4, 5. Berichte und Arbeiten. O. Küstner, 1894.

6. Die Verhütung des Kindbettfiebers in den geburtshilflichen Unterrichtsanstalten. Hofmeier, Klinische Vorträge, 1897.

These 43 fatal cases have been arranged in the order of their occurrence, and a brief statement of each case has been given in the statistical synopsis printed above. In the table No. XXXIV. the same cases are arranged in groups, according to the chief cause of death.

The following table shows the cause of death in the 28 fatal cases which died from other causes than puerperal infection, and the mortality per cent. for each cause. All these cases were delivered by the Hospital.

TABLE XXXV.

	No. Fatal Cases.	No. Cases of Complication Observed.	Mortality Per Cent.
Eclampsia	11	14	78.57%
Antepartum hæmorrhage	2	..	.....
Postpartum hæmorrhage	2	..	.....
Placenta prævia	2	31	6.45%
Rupture of uterus	4	4	100%
Pneumonia	2	16	12.5%
Phthisis	1	12	8.33%
Heart disease	1	9	11.11%
Suppression of urine from ether	1	1	100%
Erysipelas, facial	1	4	25%
Surgical kidney following vesico-vaginal fistula, 1 year postpartum	1	1	100%

The following table presents a further analysis of the deaths from septicæmia:

TABLE XXXVI.

	Delivered by Midwife, etc.	DELIVERED BY HOSPITAL.		Total.
		Operative Delivery.	Spontaneous Birth.	
First thousand	3	2	1	6
Second "	1	0	1	2
Sixth "	0	1	2	3
Eighth "	0	1	1	2
Ninth "	0	1	0	1
Eleventh "	0	1	0	1
Totals	4	6	5	15

CONGENITAL CYSTIC KIDNEYS.

By Martha Wollstein, M.D.

The specimen was removed at autopsy from a female infant (C. N. 132), born at term, who lived twelve hours. Delivery had been by forceps after a labor of fifteen hours; the position was right occipito-posterior. The child's respirations were delayed, and when finally established they remained irregular and shallow until death. The body was that of a well-nourished child, with a markedly prominent abdomen which was resistant to the touch and gave no evidence of fluctuation. There were no skin lesions and no œdema. Upon opening the cranial cavity, the pia mater was found hyperæmic over the entire brain; there was no extravasation of blood, and the brain substance was normal. In the lungs there were large atelectatic areas in both lower lobes, the anterior border of both upper lobes being emphysematous; there was marked congestion. The pleura, pericardium, and peritoneum were normal; the heart was normal, as were the pulmonary artery and the aorta. The liver, spleen, pancreas, stomach, and intestines showed no change from the normal; nor did the uterus, Fallopian tubes, ovaries, and vagina.

When the intestines were removed, two large masses were seen to fill the entire space between vertebral column and lateral body walls. These proved to be the kidneys, each measuring twelve centimetres in length, by six in breadth, and four in thickness. The suprarenal capsules were normal in size and position, capping the upper border of the kidneys. The ureters were traced from pelvis to bladder, which was very narrow, small, and empty. It was cylindrical in shape, showing no bulging at the fundus; the trigonum was readily found, the openings of both ureters and of the urethra being present, but very small. The urachus was not pervious, and the umbilical vessels were entirely normal. The kidneys, suprarenal bodies, bladder, and uterus were removed *en masse*, and weighed 375 grammes.

The following anatomical description applies to both kidneys, as their condition was practically identical. They had a distinctly boggy feel; on being opened, the cut surface presented a peculiarly cribriform effect, due to the dilatation of the renal tubules everywhere throughout the cortex and medulla. These were not distinct, the one from the other, except in a few places, where the cortex measured one centimetre in depth. For the rest,

the boundary zone between cortex and medulla was entirely lost. The tubules were all more or less dilated, and a very few cysts, none larger than a small pea, were present in the interior; on the kidney surface, beneath the capsule, there were no cysts larger than one to three millimetres in diameter. The capsule was thickened and adherent. The appearance of the pelvis, calices, and papillæ was very striking. The wall of the pelvis was smooth, grayish-red in color, and very much thicker than the corresponding portion of a normal kidney; the papillæ were not free, as is usual, in the calices, but their outline as apices of the Malpighian pyramids was lost on account of their close adherence to the thickened wall of the kidney pelvis. Of the nine or ten pyramids present, no one could be raised out of its calix, as in the normal kidney. The upper end of the ureter was a mere solid cord, two millimetres in thickness; at a point about two or three centimetres below the pelvis, the ureter became somewhat wider, and was pervious throughout the rest of its course. There was no urine in either pelvis, ureter, or bladder. The normal fœtal lobulation of a kidney at birth was entirely lost; a condition which may be explained by the stretching of the organ, due to the distended tubules and increased stroma between them. Figure 1 is a photograph of the gross specimen, and shows all the points enumerated in the description.

The blood supply, also symmetrical, varied from the normal in that two renal arteries were given off separately from the aorta on either side, about one centimetre apart; they branched but little before entering the hilus. The renal veins were single, emptying into the inferior vena cava.

Microscopical examination of sections cut through the entire depth of a Malpighian pyramid show an extremely interesting and unusual condition. The kidney capsule is several times thicker than normal, and is composed of fibrous connective tissue containing comparatively few spindle-shaped cells. Two things are strikingly suggestive in the kidney substance—the large amount and irregular folding of epithelial bands and masses, and the quantity of fibrous connective tissue, rather less cellular than is normal in the newly born. The glomeruli vary much in size, some being smaller, others larger than normal, that is, dilated. They contain either the usual capillary tuft, or a mass of flattened epithelial cells, or they are empty. They are present throughout the cortex, even close under the capsule, where some renal tubules can be seen to bend and coil, others to illustrate the first entrance of the capillary tuft into their blind extremities. None show any increase of connective tissue at the expense of their epithelial or vascular elements.

There are very few renal tubules whose epithelium resembles that in the normal convoluted tubes, and still less which can be classed as the arms of Henle's loop; as for the collecting tubules, there are scarcely any which retain their normal size, shape, and lining. The remainder of the tubules in the specimens are cylinders of epithelial cells, some hollow, some solid, the majority having no distinct membrana propria, but lying directly upon, or rather within, the connective tissue stroma, to which they are rather loosely applied.

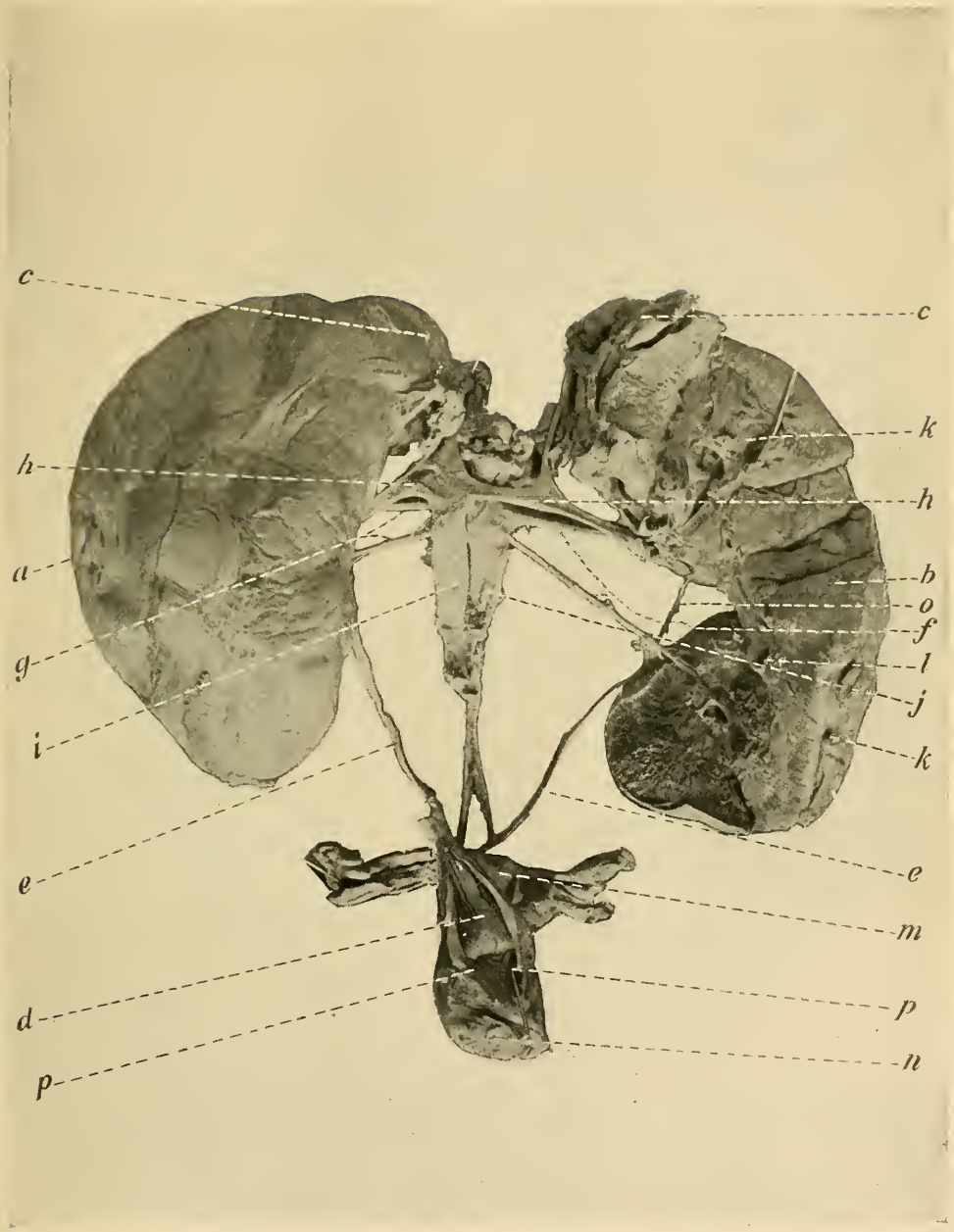

FIG. 1.—*a*, right kidney; *b*, left kidney; *c*, suprarenal capsules; *d*, bladder; *e*, ureters; *f*, two renal arteries on left side; *g*, two renal arteries on right side; *h*, renal veins; *i*, vena cava inferior; *j*, aorta; *k*, cysts; *l*, a calyx showing thickened wall and adherent papilla; *m*, uterus; *n*, vagina; *o*, narrowing of right ureter before entering pelvis of kidney; *p*, opening of ureters in bladder.

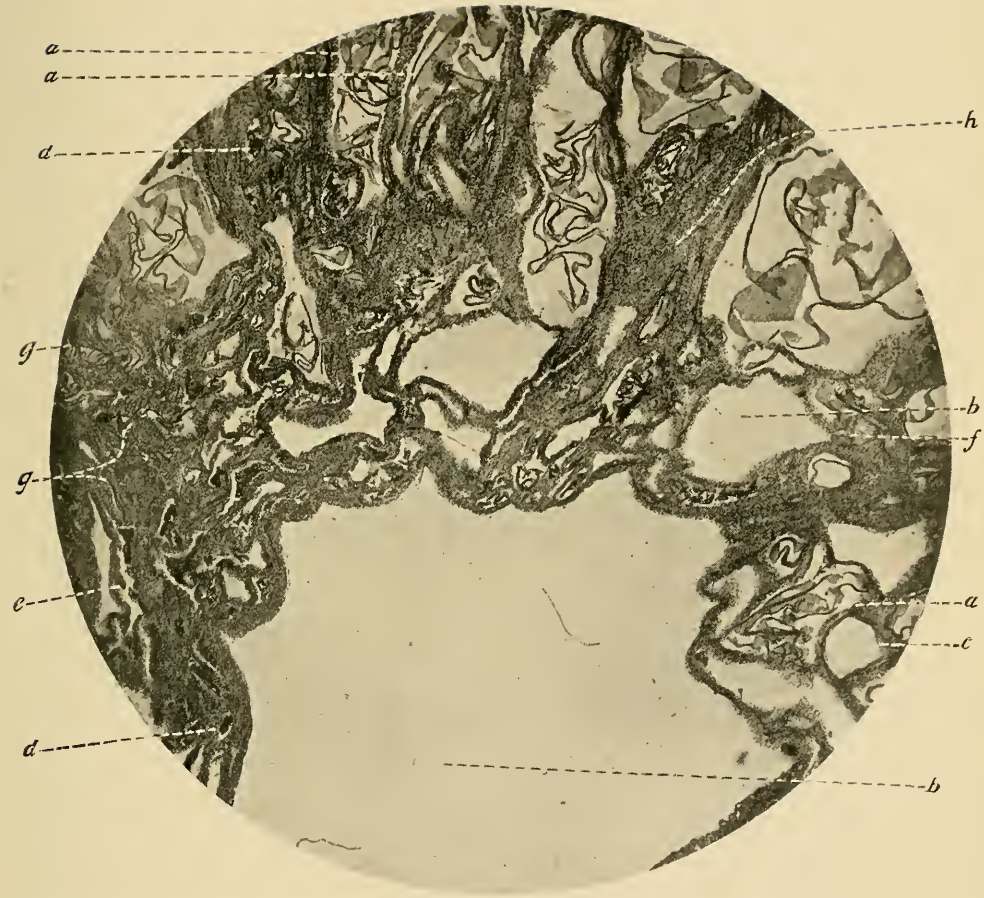

FIG. 2.—*a*, folding or convoluting of the tubes ; *b*, large cysts, empty, lining gone ; *c*, dilated glomerulus ; *d*, normal glomerulus ; *e*, projections into lumen of tubules ; *f*, glomerulus filled with epithelial cells ; *g*, collecting tubes, compressed ; *h*, stroma.

Many of the folded strands give the impression of being tubules forced to double on themselves for lack of space in which to elongate (see Fig. 2, *a*), very much as the first bend is formed in the developing kidney tubules (Minot[9]), when the capsule acts as a mechanical obstacle to further elongation. Nauwerck and Hufschmid[1] call attention to the apparent loosening of the epithelium from the stroma, and point out the fact that in some cases the membrana propria is thicker than normal; in others, normal; and in others, again, has entirely disappeared. By far the greater number of tubules in this specimen are minus a membrana propria. The same authors also think it erroneous to attribute this loosened condition to artificial causes, such as shrinking in hardening, etc.; it is certainly too universal and too constant to make the explanation plausible, or at least acceptable, as the only factor. Furthermore, were the epithelium unfolded, it would be found to be much too long a band to fit into the cavity outlined by the stroma immediately outside. That there are coiled and recoiled epithelial cylinders is evident, and that this condition can only be explained by an unusual proliferation of the epithelium in excess of the stroma, is also plain. The hollow cylinders are lined with a single row of beautifully clear, cubical cells, whose nuclei stain deeply; in addition to these there are, in places, masses of clearer, regular polygonal cells, whose nuclei stain less deeply than the others. They resemble exactly the nests described by Nauwerck and Hufschmid, and fill not only the cylindrical tubes, but the globular glomeruli as well. Karyokinetic figures can be demonstrated in the epithelial cells in many places.

While no branched papillary outgrowths were found in any one of the sections, there are many small projections of the cyst wall into the lumen, carrying the lining epithelium with them. There are also numerous examples of the solid branches of tubes (Sprossenbildung) pictured by Nauwerck and Hufschmid,[1] some of which show their origin distinctly. Near the apex of a Malpighian pyramid there are small tubules, whose epithelial lining is a row of low columnar cells, resembling a compressed and inactive collecting tube. The connective tissue in this region is greater in amount than in any other portion of the kidney.

The wall of the pelvis is greater in actual depth than the kidney capsule; no trace of a lining epithelium remains, and the papillary apex is united to the pelvis by a distinct zone of round cell infiltration, evidently inflammatory in origin. The blood vessels are normal as to the structure of their walls, and are neither increased nor diminished in number. Some of the tubules and cysts contain a small quantity of fine granular material, but nowhere any colloid substance.

This condition of the pelvis and papillæ would seem, at first, to illustrate to a nicety the theory of Virchow[2] as to the formation of congenital renal cysts—assuming a fœtal nephritis, in reality a pyelonephritis, causing atresia of the papillary orifices and dilatation of the renal tubules in consequence of their compression by connective tissue. But this explanation clears up only a part of the specimen, leaving the epithelial proliferation entirely unelucidated. Evidently, instead of remaining passive and becom-

ing more and more flattened as the tubule walls became distended, the epithelium here took an active part in the process, giving rise to a condition distinctly adenomatous in character.

Nauwerck and Hufschmid[1] have endeavored to prove that these cystic kidneys are to be classed as multilocular adenocystomata, explaining the inflammatory zone between the kidney and pelvis as analogous to the round cell infiltration almost constantly found at the periphery of epithelial tumors, and the inflammatory process in the pelvis and kidney substance as the result, not the cause, of the cyst formation (pressure). Arnold[3] has shown conclusively that a primary fœtal nephritis does occur, but the specimen he so described was an atrophic kidney with microscopic cysts only. Virchow[4] still upholds his original theory, and emphatically denies the neoplasmic origin of this condition. Chotinsky[5] and Brigidi and Severi,[6] though conservative, are yet inclined toward the neoplasmic view, and Phillipson[7] considers it an open question whether the proliferating epithelium is really a beginning adenoma, or merely a compensatory hypertrophy. Bland-Sutton[8] takes a view radically different from any other observer, in that he considers cystic kidneys, both fœtal and adult, as retention cysts of persistent Wolffian (mesonephritic) tubules, and thus classes paroöphoron cysts, kidney cysts, and innocent cysts of the testicle as identical, under the teratomata.

Congenital cystic kidneys have been recorded which were so large as to seriously interfere with delivery (Orth)[10] or to cause death in a few hours or days, as in the present case, through interference with respiration by pressure upon the diaphragm. On the other hand, the condition has remained unsuspected until found at the autopsy in adult life. It is quite common to find other malformations coexisting. As reported above, the only other defect present in this case was that of the bladder, and how much its lack of size (dilatation) was due to the absence of the mechanical factor of urine distension can only be surmised.

Two explanations of this specimen are possible—either there was a fœtal pyelonephritis accompanied by marked epithelial hypertrophy, or else a fœtal cyst-adenoma with resulting peripheral inflammation. The etiology of both conditions is equally dark. Microscopic study, however, points to the latter as the more tenable hypothesis, in that it covers all the changes noted. Beyond the papillary zone, no evidences of nephritis exist.

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DEFORMED PELVES.

By Austin Flint, Jr., M.D.

The statistics on which this article is based, include cases already reported in a paper entitled "Observations on Pelvic Deformities," read before the New York State Medical Association, October 16, 1895. The observations then made were mainly for the purpose of determining the frequency with which pelvic deformities occurred; and in most of the cases the deformity was very slight. When the Hospital first began its work, the cases were in some respects imperfectly recorded; and, as many instances of minor pelvic deformity were undoubtedly overlooked, the first 2,000 histories were not included in the statistics, and the figures were obtained in 6,000 consecutive cases, from numbers 2,000 to 7,000 inclusive. The observations now recorded include the 2,000 previously omitted and the 6,000 previously reported, and have been studied with reference more particularly to instances in which deformity is well marked. In addition to this, 2,233 women have since been confined, making a grand total of 10,233 observations.

Although the object in reporting these cases is to ascertain the results in instances of marked deformity, before tabulating and analyzing these, some general facts in regard to the frequency of pelvic deformity in all degrees will be of interest.

It is necessary, as a preliminary, to define what is meant by pelvic deformity; and to do this, some standard of size must be adopted, below which pelves may be called "deformed." As in the cases reported in the previous article, observations have still been recorded according to the limits of contraction as defined by Litzmann and followed by the majority of German writers, in which all cases with an external conjugate of eighteen centimetres or less, or 7.2 inches, were regarded as contracted; but these statistics include only cases in which the conjugate measured seven inches or less. As regards the true conjugate, Litzmann included as contracted all cases with a measurement of 9½ centimetres or 3.8 inches. Disregarding, for the moment, the true conjugate, which must be estimated from the diagonal, I include as contracted all cases with a diagonal measurement of 4½ inches, or an estimated true conjugate falling slightly below this limit.

Under this definition of pelvic deformity, in a total of 10,233 cases observed, contraction was present in 856 cases, or 8.36 per cent. Comparing this percentage with statistics from European sources, it will be noticed

that it is quite markedly less. Thus: Michaelis, in 1,000 cases, obtained a percentage of 13.1; Litzmann, 14.9. Winckel believes that from 15 to 20 per cent. of women have contracted pelves; Kaltenbach, 14 to 20; Schanta, 20. The report from Leopold's clinics for 1895 records a frequency of 24.3 per cent. It has already been stated that in the first 2,000 cases recorded at the Hospital, many instances of minor deformity, according to these measurements, were omitted, and consequently the first 2,000 were disregarded. In the previous investigations, the histories numbered from 4,000 to 6,000, and from 6,000 to 8,000, showed a frequency of 249 and 251 respectively, or 12.4 and 12.9 per cent. respectively; and these percentages are correct if we accept the definition of deformity which has been described, rather than the percentage of 8.36 in 10,233 cases. A conclusion that may be drawn is, that in New York, with its large foreign population, pelvic deformities occur with about the same frequency as in Europe, under the same standard of measurements; but, as will be shown later on, pelvic deformity in which the obstruction is serious enough to be noticed, does not occur with the same frequency here as abroad, even when compared with the conservative estimate of Winckel. A more careful observation and a larger experience in the treatment of these cases has convinced me that, when the external conjugate diameter is the only one which falls below the standard, contraction does not necessarily exist.

As a part of the routine of the Hospital, all applicants are carefully examined and measured. These measurements are made by students, under the direct supervision of the resident staff of the Hospital and the Board of Assistant Attending Physicians. To insure more accuracy of observation, whenever a case with any of the measurements falling below the standard is found, it is referred for diagnosis to the assistant attending physician on duty in the examining-rooms for that day. In other words, external measurements are no longer relied upon, but internal measurements, made by a skilled observer, are made before the case is recorded as one of deformity. This plan, it is believed, will render future observations much more accurate and uniform.

Of the 856 cases of deformity recorded, in 710 deformity was very slight, or, possibly, did not exist. The external conjugate measured seven inches or less in all, but labor was not modified, with the exception, perhaps, of being prolonged; and nearly all the deliveries were spontaneous. In this number there were 14 forceps deliveries in which pelvic deformity was mentioned in the account of the operation. In none of these cases, however, was the diagnosis of contraction borne out by pelvic mensuration, so that they have been included in the 710 doubtful cases, and not in the well-marked cases.

In 146 cases deformity was marked. This means a frequency in 10,233 of but 1.42 per cent., which is insignificant as compared with the ordinary European statistics, and very moderate as compared with the 5 per cent. of serious obstruction estimated by Winckel.

The following is a synopsis of the 146 instances of marked pelvic deformity:

TABLE OF DEFORMED PELVES.

C. N.	Birthplace.	Age.	Para.	Month of Gest.	Variety of Deformity.	Conj. Vera.	Presentation.	Position.	Result. Mother.	Result. Child.	Remarks.
26	U. S.	35	V.	9	Justo-minor	.....	Vertex	L. O. A.	Recovered	Living	Forceps; fracture child's skull.
214	Germany	36	II.	9	Contracted outlet (rigid coccyx)	.....	"	"	"	"	[had hip disease as a child.
1,018	U. S.	35	IV.	10	Oblique pelvis	....	"	"	"	"	Right iliac fossa shallow; manual extraction of head;
1,143	Russia	35	III	10	Simple flattened	3¼	"	"	"	"	
1,163	"	21	I	10	Justo-minor	3¼	"	L. O. P.	"	Still birth.	Three previous still births; child's head impinged on prom.; large depression, ¾ in., child's head; attempted forceps; podalic version.
1,175	"	21	IV.	10	Simple flattened	3¼	"	L. O. A.	"	"	All prev. labors still; podalic version; prolapsed cord.
1,214	"	36	V.	10	" "	3¼	"	"	"	Living	Twins; both living; both L. O. A.
1,223	"	30	V.	10	" "	3¼	"	R. O. A.	"	"	
1,317	"	32	VIII.	10	" "	3¼	"	L. O. A.	"	"	
1,483	"	33	I.	10	Flattened, generally contracted	3¼	"	"	"	"	
2,382	"	32	IV.	9	Simple flattened	3¼	Shoulder		"	"	Cephalic version, then forceps.
2,532	"	35	I.	9	Justo-minor	3 3¼			"	"	Forceps; lacerated perineum.
2,645	U. S.	31	VI.	7½	Spondylolisthetic	3¼	Breech	R. S. P.	"	Still birth.	Labor induced.
2,769	Russia	28	V.	10	Flattened, generally contracted	3	Vertex	L. O. A.	"	"	Version; craniotomy.
3,252	"	33	II.	10	Simple flattened	3¼	"	R. O. A.	"	Living	Median forceps. [perineum.
3,463	R. Poland	24	I.	9	Flattened, generally contr'd pelvis	3¼	"	L. O. A.	"	"	Pubic arch narrow; prolapsed cord; version; lacerated
3,601	Russia	18	I.	10	Flattened, generally contracted	3¼	"	R. O. A.	"	Still birth.	Pressure against prom. caused depression of right parietal; manual dilatation cervix; podalic version.
3,692	Austria	24	I.	9	Simple flattened	3¼	"	L. O. A.	"	Living	Symphysiotomy and version.
3,858	Russia	24	II.	10	Flattened, generally contr'd pelvis	3¼	"	"	"	"	Low forceps.
4,170	"	19	I.	10	Simple flattened	3¼	"	L. O. P.	"	"	Median forceps.
4,219	"	18	I.	10	" "	3¼	"	R. O. P.	"	"	Manual dilatation cervix; median forceps.
4,705	"	26	III.	9	" "	.....	"	L. O. A.	"	"	Forceps; albuminuria.
4,825	"	30	IV.	10	" "	3¼	"	R. O. P.	"	"	High forceps.
4,891	"	25	II.	9	Flattened, generally contracted	3¼	"	L. O. A.	"	"	[otomy; perineorrhaphy.
5,168	"	19	I.	9	Simple flattened	3¼	"	"	"	"	Acconchement forcé; podalic version; symphysi-
5,456	Germany	30	VII.	10	Flattened, generally contracted	3¼	"	"	"	Still birth.	Podalic version; macerated.
5,506	Russia	34	I.	9	Scolio-rachitic pelvis	3¼	"	"	"	Living	Cæsarean section. [minuria.
5,610	"	25	II.	9	Flattened, generally contr'd pelvis	.....	"	R. O. A.	"	"	Symphysiotomy; version; fractured humerus; albu-
5,633	"	19	I.	9	Simple flattened pelvis	3¼	"	L. O. A.	Died	"	Sepsis; died 1st day; forceps; albuminuria; fever.
5,721	"	18	I.	9	Justo-minor pelvis	3¼	"	"	Recovered	"	Forceps.
5,799	U. S.	24	III.	9–10	Contracted outlet; narrow arch	.....	.....	.....	Died	"	Podalic version; uræmia.
6,000	Russia	21	I.	10	Simple flattened	3¼	"	"	Recovered	"	Forceps; trachelorrhaphy.
6,009	"	35	VII.	10	" "	3¼	"	L. O. A.	"	"	Podalic version; prolapsed cord.
6,039	"	29	III.	10	" "	3¼	"	L. O. P.	"	Still birth.	" " extended after-coming head.
6,069	Austria	26	II.	10	Obliquely contracted pelvis	.....	"	L. O. A.	"	Living	
6,077	Poland	27	II.	10	Flattened, contracted pelvis	3¼	"	"	"	Died	Forceps; version.
6,095	Germany	25	IX.	9–10	Generally contracted, flattened	3¼	Est. Vertex	R. O. P.	"	Still birth.	Podalic version.
6,099	Italy	28	V.	9–10	" " "	3¼	"	L. O. A.	"	"	"
6,132	Russia	30	IV.	9	Simple flattened	3¼ +	Vertex	"	"	Living	Forceps; trachelorrhaphy.
6,144	...	...	...	...	Simple contracted pelvis	.....	"	"	"	Still birth.	Consultation case; no history; forceps.
6,521	Austria	26	VI.	9	Justo-minor pelvis	3¼	"	"	"	Living	
6,603	Russia	33	VIII.	9	Simple flattened	3¼–¾	"	"	"	"	Version; prolapsed cord.
6,612	"	29	IV.	9	Justo-minor pelvis	3¼	"	"	"	"	Version.
6,697	"	22	I.	10	Simple flattened	3¼ +	"	L. O. P.	"	Still birth.	Manual rotation of head; low forceps.
6,698	"	20	II.	9	Justo-minor pelvis	3¼	"	L. O. A.	"	Living	
6,702	"	20	II.	7	" "	3¼	"	"	"	Still birth.	Premature.
6,899	"	24	II.	9	" "	3¼	"	L. O. P.	"	Died	Forceps.

C. N.	Birthplace.	Age.	Para.	Month of Gest.	Variety of Deformity.	Conj. Vera.	Presentation.	Position.	Result. Mother.	Result. Child.	Remarks.
7,112	Russia	33	III.	9	Justo-minor pelvis	3½	Breech	L. S. A.	Recovered	Living	Manual extraction; fractured humerus.
7,115	Poland	35	III.	9	Flattened, rachitic dorsal scoliosis	3½	Vertex	L. O. A.	"	"	
7,198	Germany	35	IV.	10	Flattened, generally contracted	3½	"	"	"	"	Symphysiotomy; version.
7,224	Russia	19	I.	9	Justo-minor pelvis	3½	"	R. O. A.	"	Died	Forceps.
7,316	"	20	I.	9	" "		Brow posit.		"	Living	Brow changed to L. O. A.
7,358	"	25	II.	9	Simple flattened pelvis	3½	Vertex	L. O. A.	"	"	
7,366	"	23	II.	9	" " "	3½	"	"	"	"	
7,384	U. S.	19	I.	10	" " " rickets	5½	"	"	"	"	Symphysiotomy; version
7,466	Russia	38	III.	9	" " "	3¼	"	L. O. P.	"	Still birth.	Forceps.
7,497	"	29	IV.	9	" " "	3¾ +	"	L. O. A.	"	Living	
7,526	"	21	II.	9	Justo-minor pelvis		"	"	"	"	
7,549	"	32	IV.	9	" "	3½	"	"	"	"	
7,570	Poland	20	II.	9	Simple flattened pelvis	3½	Left ear		"	"	Version; woman had symphysiotomy, 1893.
7,641	Russia	30	III.	9	Pubic arch narrow		Vertex	L. O. A.	"	"	
7,665	Austria	37	III.	10	Simple flattened	3¾ +	" L	Moment'n.	"	Still birth.	Prolapsed cord; podalic version; fractured arm.
7,673	Germany	31	V.	10	Flattened, generally contracted	3½	"	L. O. A.	"	Living	
7,700	Hungary	30	IV.	9	Simple flattened	3½	"	"	"	"	
7,728	Austria	22	I.	9	Justo-minor pelvis	3½	Shoulder	R. Sac. A.	"	"	Version.
7,742	Poland	24	IV.	9	Simple flattened	3½	Face	L. M. P.	"	"	"
7,746	Russia	33	VII.	9	Justo-minor	3½	Vertex	L. O. A.	"	"	
7,756	"	35	VI.	9	Simple flattened pelvis	3½	"	"	"	"	
7,779	"	28	IV.	9	" "	3½	"	R. O. A.	"	"	
7,813	"	25	I.	10	Male type; contr'd outlet; ischial tuberos; narrow arch.	3¼	Brow	Occiput to left.	"	"	Symphysiotomy; version; perineorrhaphy; attempted forceps.
7,906	"	31	V.	9	Simple flattened pelvis	3½	Vertex	L. O. A.	"	"	
7,922	"	25	II.	10	" " "	3½	"	"	"	"	
7,967	"	26	II.	9	" " "	3½	"	R. O. A.	"	"	Version; perineorrhaphy.
8,042	"	29	V.	10	" " "	3½	"	L. O. A.	"	"	
8,053	"	37	VII.	9	" " "	3½	"	"	"	"	
8,056	Austria	24	VI.	10	" " "	3½	"	"	"	"	
8,072	Russia	33	IV.	9	" " "	3½	Breech	R. Sac. A.	"	"	Manual extraction breech.
8,075	"	20	I.	9	Justo-minor	3½	Vertex	L. O. A.	"	"	
8,183	Austria	24	II.	9	Simple flattened pelvis		"	R. O. A.	"	"	
8,084	Russia	28	III.	9	" " "	3½	"	L. O. A.	"	"	
8,095	Austria	21	I.	10	" " "	3¼	"	"	"	"	
8,107	Russia	30	III.	10	" " "	3¼	"	"	"	"	
8,136	"	24	I.	10	Flattened, generally contr'd pelvis	3½	"	R. O. A.	"	"	
8,137	"	32	I.	10	Justo-minor pelvis	3½	"	L. O. A.	"	"	
8,155	"	24	V.	10	Simple flattened pelvis	3½	"	R. O. A.	"	"	
8,165	"	25	I.	9	" " "	3½	"	"	"	"	[perineorrhaphy. Accouchement forcé; version; trachelorrhaphy and
8,181	"	23	II.	9	Generally contracted pelvis	3½	"	L. O. A.	"	"	
8,244	"	25	II.	10	Simple flattened	3¼	"	"	"	"	
8,248	"	24	IV.	9	" "	3½	"	"	"	"	
8,258	"	26	III.	10	" "	3½	"	R. O. A.	"	"	
8,279	"	28	IV.	9	" "	3½	"	R. O. P.	"	"	
8,286	"	32	VI.	9	" "	3½	"	L. O. A.	"	"	Albuminuria.
8,305	"	21	I.	10	Justo-minor	3½	"	R. O. A.	"	"	
8,327	"	20	II.	9	Simple flattened pelvis	3½	"	L. O. A.	"	Still birth.	
8,344	U. S.	19	I.	9	Justo-minor	3¼	"	"	"	Living	
8,350	Russia	25	III.	9	Simple flattened pelvis	3½	"	"	"	"	Version.
8,354	"	35	I.	9	Flattened obliquely; contracted	3½	"	R. O. A.	"	"	

TABLE OF DEFORMED PELVES. (CONCLUDED.)

C. N.	Birthplace.	Age.	Para.	Month of Case.	Variety of Deformity.	Conj. Vera.	Presentation.	Position.	Result. Mother.	Result. Child.	Remarks.
8,356	Russia	28	V.	9	Simple flattened pelvis	3¼	Vertex	L. O. A.	Recovered	Living	
8,368	"	28	VII	10	" " "	3¼	Breech	R. Sac. A.	"	"	Manual extraction breech.
8,370	"	24	III	10	" " "	3¼	Vertex	R. O. A.	"	"	
8,387	"	25	II	9	Flattened, generally contracted (2).	3¼	Breech (2)	L. S. A. / L. S. P.	"	Both living	Twins; manual extraction breech, both cases.
8,388	"	22	I	9	Simple flattened pelvis	3½	Vertex	L. O. A.	"	Died	Forceps.
8,420	"	21	III.	9	Flattened, generally contracted	3¼	"	"	"	Living	
8,573	"	25	I	9	" " "	3¼	"	R. O. A.	"	"	
8,627	Russia	22	I.	10	Simple flattened	3¼	" L	R. O. P.	"	Still birth.	Median forceps.
8,633	"	24	IV.	9	Simple flattened pelvis	3¼	"	R. O. P.	"	Living	Occipito-posterior.
8,651	Poland	27	V.	10	" " "	3¼	"	L. O. A.	"	"	High forceps.
8,699	Russia	32	III.	9	Justo-minor	3¼	"	"	"	"	
8,764	Ireland	30	III.	9	Justo-minor pelvis	3¼	"	"	"	"	
8,794	Russia	22	I.	9	Simple flattened pelvis	3¼	"	"	"	"	Perineorrhaphy.
8,812	"	33	IV.	9	" " "	3¼	"	"	"	"	
8,822	U. S.	24	II.	9	" " "	3¼	"	"	"	"	
8,880	Russia	27	III.	9	Simple flattened tumor, obstructing superior strait.	3	"	"	"	Died	Version; depression child's skull.
8,932	Austria	30	III.	10	Simple flattened	3¼	"	R. O. A.	"	Living	
8,958	Poland	30	V.	9	Justo-minor pelvis	3¼	"	"	"	"	
8,960	Russia	24	I.	9	Simple flattened pelvis	3¼	"	L. O. A.	"	"	Perineorrhaphy.
8,962	"	22	VI.	9	" " "	3¼	"	"	"	"	
9,084	"	33	I.	9	" " "	3¼	"	R. O. A.	"	"	
9,162	"	32	IV.	10	Justo-minor	3¼	"	L. O. A.	"	"	
9,185	"	37	VI.	10	"	3¼	"	R. O. A.	"	"	
9,213	"	33	V.	9	Simple flattened pelvis	3¼	"	L. O. A.	"	"	Albuminuria.
9,230	"	35	IV.	10	" " "	3¼	"	"	"	"	
9,253	"	24	III.	9	Justo-minor	3¼	"	"	"	"	
9,403	"	26	I.	10	Simple flattened	3¼	"	"	"	"	
9,424	"	22	X.	8	" " "	3¼	"	"	Died	"	Extreme moulding of child's head.
9,439	"	28	VI.	10	Justo-minor	3¼	"	"	Living	"	
9,503	"	24	I.	10	Simple flattened	3¼	" L	"	"	Still birth.	Prolapsed cord; laceration of cervix; podalic version.
9,917	"	33	V.	10	" "	3¼	"	"	"	Living	First, forceps; then version.
9,919	"	32	V.	10	" "	3¼	"	"	"	"	" " "
9,921	"	29	I.	9	Justo-minor	3¼	"	L. O. P.	"	"	Forceps; occipito-posterior.
9,928	"	30	IV.	10	Simple flattened	3¼	"	R. O. A.	"	"	
9,932	U. S.	26	VI.	9	Justo-minor	3¼	"	"	"	"	
9,942	Russia	30	IV.	10	Simple flattened pelvis	3¼	"	L. O. A.	"	"	
9,961	"	25	III.	9	Justo-minor	3¼	"	"	"	"	
10,002	"	33	IV.	9	"	3¼	Vertex	R. O. A.	"	"	
10,034	Austria	36	IX.	10	"	3¼	"	"	"	"	[weeks later.
10,047	Russia	30	II.	9	Simple flattened	3¼	"	L. O. A.	Died	Still birth.	Accouchement forcé; version; mother died three
10,079	"	29	V.	9	Justo-minor	3¼	"	"	Recovered	Living	
10,128	Hungary.	26	I.	9	" narrow arch	3¼	Vertex	R. O. P.	"	Still birth.	Forceps; occipito-posterior.
10,136	Russia	25	I.	10	Simple flattened	3¼	"	L. O. A.	"	"	Podalic version; prolapsed cord; forceps attempted.
10,149	"	30	IV.	10	Justo-minor	3¼	"	R. O. A.	"	Living	High forceps.
10,150	U. S.	24	II.	9	"	3¼	"	L. O. A.	"	"	
10,165	Russia	27	III.	9	"	3¼	"	"	"	"	
10,183	"	30	IV.	10	"	3¼	"	R. O. A.	"	"	
10,202	Austria	33	VI.	10	Simple flattened	3¼	Breech	L. Sac. A.	"	"	Extraction breech.
10,221	Russia	28	V.	10	"	3¼	Vertex	L. O. A.	"	"	

An analysis of this Table of Deformed Pelves shows the following :

As regards etiology, the record of nativity is important:

Russia	110	Hungary	2
United States	9	Ireland	1
Austria	10	Italy	1
Poland	7	Not noted	1
Germany	5		146

A glance shows that the great majority of the patients were Russians. There are one hundred and thirty-six foreign born and but nine natives, disregarding the one case in which the nativity was not noted. This great preponderance of foreign over native women exists not only in cases of pelvic deformity, but also in the general statistics, and very nearly in the same proportion.

Thus, in a total of 10,233 cases, the nativity in 163 cases was not noted, 910 were native, and 9,180 were foreign born.

GENERAL STATISTICS.	DEFORMED PELVES.
Native, 910 ; foreign, 9,180. A proportion of 1 to 10.08.	Native, 9 ; foreign, 136. A proportion of 1 to 15.11.

About one-third less in the deformed pelvis cases than in the general statistics. The majority of all the foreign-born patients were also Russians, 6,885 in a total of 9,180.

It is still worthy of note that only nine cases of marked pelvic deformity were observed among nine hundred and ten women of American birth.

As regards the age of the patients, the majority were between twenty and twenty-five.

AGE OF PATIENTS.

	Cases.		Cases.
Under 20	7	Between 35 and 40	7
Between 20 and 25	67	Not noted	1
" 25 " 30	44	Total	146
" 30 " 35	20		

The para is recorded as follows:

PARA.

	Cases.		Cases.
I	38	VII	5
II	24	VIII	2
III	22	IX	2
IV	24	X	1
V	17	Not noted	1
VI	10	Total	146

Even a marked pelvic deformity does not seem to act as a bar to bringing up quite a large family of children. One hundred and eight of the women were multiparæ.

Month of Gestation.

	Cases.		Cases.
7½ months in	1	9 to 10 months in	143
8 " "	1	Not noted	1

It is interesting to note that the pelvic deformity had apparently no effect whatever, as far as the pregnancy was concerned. Nearly all were delivered at full term.

Variety of Deformity.

	Cases.		Cases.
Simple flattened pelvis	79	Scolio-rachitic	1
Justo-minor pelvis	39	Male type (transversely contracted outlet)	1
Flat, generally contracted, pelvis	19	Narrow pubic arch	1
Naegele's oblique pelvis	3		
Contracted outlet	2		
Spondylolisthetic	1	Total	146

The simple flattened type predominated, occurring in more than one-half of the cases. It is unfortunate that the histories are not sufficiently clear to enable me to separate the rachitic and non-rachitic varieties with any degree of accuracy.

The degree of deformity is perhaps of more importance than the type, and a table has been made as follows:

Conjugata Vera.

Inches.	Cases.	Inches.	Cases.
3¾	79	3⅝	1
3½	24	3⅜	1
3½ to 3¾	2	3	3
3¼	20	Not noted	12
3⅛	2		
3 to 3¼	2	Total	146

I have put down the conjugata vera exactly as it was recorded in the history, in each case. In some instances no conjugata vera was recorded when the diagonal measured 4½ inches, and in such cases I have estimated the vera as 3¾, irrespective of the height of the symphysis or the inclination of the pelvis. For this reason, 3¾ make up about half of the cases.

Of the twelve cases in which no conjugata vera is recorded, two were cases of Naegele oblique pelvis; one was a case of contracted outlet (3¼ inches between the ischial spines); two were cases of "rigid coccyx;" one was a case of "narrow pubic arch:" one was a consultation case in which no measurements were taken; and seven were cases in which, while deformity was present, as shown by the mechanism of the labor, no conjugate was recorded. In these last cases, the fault was in recording the history; so that, although impossible to classify, they must be included as "deformed."

In the one hundred and forty-six cases in the table, the following operations were performed:

Forceps	24
Attempted forceps (followed by version)	6
Podalic version (6 cases after forceps)	33
Cephalic version	1
Symphysiotomy	6
Extraction of breech (1 case twins)	6
Accouchement forcé	5
Cæsarean section	1
Manual extraction of head	1
Induced labor	1
Conversion brow to vertex	1
Craniotomy on after-coming head	1
Total	86

These eighty-six operations were done on sixty-seven cases. In the remaining seventy-nine delivery was spontaneous. In none of the spontaneous cases was the conjugate less than $3\frac{1}{4}$ inches, although the conjugate was so recorded in seven instances.

COMPLICATIONS.

	Cases.
Fracture, child's skull (forceps)	1
"Depression," child's skull (version)	3
Fracture humerus	3
Prolapsed cord	7
Albuminuria	5
Lacerated perineum (requiring suture)	8
" cervix " "	4
Extension after-coming head	1
Uræmia	1

An analysis of position and presentation shows the following:

Position.	Cases.
L. O. A	89
R. O. A	26
L. O. P	7
R. O. P	8
L. Sac. A	3
R. " P	2
R. " A	1
L. Scap. A	1
R. " A	1
L. M. P	1
Not noted	7
Total	146

Presentation.	Cases.
Vertex	130
Shoulder	2
Brow	2
Left ear	1
Face	1
Breech	6
Not noted	4
Total	146

The general result as regards mortality in the one hundred and forty-six cases is as follows:

Maternal deaths	3
Children still-born	19
" who subsequently died	7

Of the three maternal deaths, one was in a case of albuminuria, death occurring the first day postpartum, with fever. The second death occurred three weeks postpartum, from sepsis, and the third fatal result was due to uræmia also, about three weeks after the delivery. This case was a forceps delivery indicated by a sharply curved and rigid coccyx, and is included among the twelve cases of irregularly deformed pelves.

The results in the various degrees of contraction are of such importance, that I repeat the table of measurements, dividing the cases into four classes:

	Cases.
Pelves measuring $3\frac{3}{4}$ inches or more	79
" " $3\frac{1}{2}$ " and less than $3\frac{3}{4}$	27
" " $3\frac{1}{4}$ " " $3\frac{1}{2}$	23
" " 3 " " $3\frac{1}{4}$	5
Total	134

These, with the twelve cases of irregular contraction, make a total of 146.

Taking up the first seventy-nine cases, in which the conjugata vera measured $3\frac{3}{4}$ inches or more:

	Cases.
Delivery was spontaneous in	53
" by forceps in	16
" by a manual extraction of a breech presentation in	4
" was premature in	1
" by version for a shoulder presentation in	1
" " after symphysiotomy in	1
" " for prolapse of the cord in	3
Total	79

Results.—Among these cases there was one maternal death, a forceps delivery in a case of albuminuria and fever, death occurring on the first day postpartum.

There were also ten fœtal deaths, as follows:

	Cases.
In a spontaneous delivery (no cause assigned)	1
After a forceps delivery	5
" version delivery and prolapsed cord	2
" premature delivery	1
" prolonged labor and extreme moulding of the head	1
Total	10

Conjugata Vera Measuring 3½ Inches and Less than 3¾.

The twenty-seven cases in this class terminated as follows:

	Cases.
Delivery was spontaneous	11
" " by version	13
" " " forceps	2
" " " a manual extraction of breech	1
Total	27

The forceps cases were uncomplicated.

In eleven of the cases delivered by version, the operation was complicated as follows:

	Cases.
By previous attempts to deliver with forceps, one of these also having a prolapsed cord	4
By a symphysiotomy	1
By a prolapsed cord	2
By an ear presentation	1
By so-called "accouchement forcé"	2
By extension of the head at the brim	1
Total	11

It is interesting to note that in one of these version cases a living child was extracted through a pelvis which had required the operation of symphysiotomy at a previous confinement.

Results.—In this group there likewise occurred a maternal death, the woman dying of sepsis three weeks postpartum. The conjugate measured 3½ inches, and version was performed after a manual dilatation of the cervix.

There were seven still births, and one subsequent death of the child.

1 still birth was after a forceps delivery.
2 after version operations that were uncomplicated.
1 after a version, attempted forceps, and prolapsed cord.
1 " " and prolapsed cord.
1 " " in which the mother also died.
1 " " in which the extended head was arrested at the brim.

The subsequent death of the child followed a delivery by version after forceps had failed.

Of these cases, which were not what might be called very highly contracted, eleven were spontaneous deliveries. In the sixteen operative deliveries, delivery by forceps was attempted six times and was successful in but two instances; and in the fourteen remaining cases, the child was extracted by the feet.

This seems to prove that a head can be dragged through a contracted brim more successfully when it is made to engage by the smaller "wedge-shaped" base than by the more rounded vault. Whether the ultimate result for the child is as favorable, taking into account the probable delay in the extraction of an after-coming head, is questionable.

Conjugata Vera Measuring 3¼ Inches and Less than 3½.

There were twenty-three cases in this class.

	Cases.
Delivery was spontaneous	10
" " by forceps	1
" " " following a cephalic version	1
" " " a manual extraction of the breech after an induced labor	1
" " " version	10
Total	23

It will be seen that in this series nearly one-half were spontaneously delivered, although the contraction was marked. In the remainder, delivery by forceps was attempted in three and was successful in but two instances. In eleven cases the child was extracted by the feet. Of the ten cases in which podalic version was done, symphysiotomy was necessary in two instances, and the choice of version, rather than of forceps, indicated in two others by prolapse of the cord. What has been said of the advantages of version over forceps in slightly larger pelves, seems to be more markedly demonstrated in this series, in which the contraction is more pronounced.

Results.—There were no maternal deaths and five still births—one in the forceps case, another in the induced labor case in which the breech presented, and three followed delivery by version. Of the later three, one was macerated, and two had a depression of the skull. One of these had been subjected to an ineffectual effort to deliver by high forceps, and the fracture in the other case was due to efforts to extract the after-coming head.

Conjugata Vera Measuring 3 Inches and Less than 3¼.

There were but five such cases, and the delivery was by—

	Case.
Forceps	1
Symphysiotomy and version	1
Version	1
Cæsarean section	1
Version followed by a craniotomy on the after-coming head	1

Results.—No maternal deaths.

Two fœtal deaths in the version cases, in one of which there was a depression of the child's skull, resulting from the efforts to extract through a conjugate of but three inches. In the second, extraction was performed with great difficulty after perforating and crushing the after-coming head.

All of the fatal cases, both fœtal and maternal, occurred in these cases which have been described in detail, with the exception of the delivery of one still-born child by forceps, in consultation in a case in which no measurements were obtained.

An analysis of these cases brings up several points of interest which might be discussed at length.

First.—The question of frequency, both in regard to cases of moderate deformity and cases in which deformity is well marked.

Second.—The influence of the deformity on labor in the various degrees of contraction.

Third.—The best means of extraction in the various degrees, and the results.

Under the first heading, regarding the frequency, but little remains to be added to a plain statement of figures. Deformity of all degrees may be met with in practice, in about 12½ per cent. of all cases, according to the standard of measurements used in foreign statistics. This result was obtained, not in the whole number of cases observed, but in four thousand consecutive cases. Deformity serious enough to materially influence labor and demand active operative interference may be met with in about 1½ per cent. of all cases.

In comparison with foreign statistics, deformity marked enough to form a serious obstacle to delivery occurs in about one-third as many instances, and slight deformity with about the same frequency.

Statistics from the Boston Lying-in Hospital give a frequency of two per cent. in native women and six per cent. in foreign women (Reynolds).

Under the second heading, the influence of the various degrees of contraction on labor, it may be said that a large proportion are delivered spontaneously, even when the obstruction is apparently formidable. In cases that demand interference, the choice of operation depends more on the size of the child's head, the character of the labor pains, and malpresentations or positions, than on the degree of contraction itself. This is illustrated by abundant facts in the tables. As examples may be mentioned the case requiring symphysiotomy, with a conjugate of 3¾ inches, and the spontaneous deliveries in cases of 3¼ inches. When the contraction is marked, and delivery is not spontaneous, the operations that are required are, as a rule, the more difficult major operations.

Third.—The best means of extraction in the various degrees.

It is difficult to make rules to govern the treatment, except when the deformity is very marked—under 3¼ inches. With a conjugate of about that diameter, spontaneous delivery is possible in a larger proportion of cases than is ordinarily supposed.

When the disproportion between the size of the head and the size of the canal is not marked enough to prevent extraction by the natural passages, the choice lies between forceps and version.

Delivery by forceps has been successful mainly in the cases where a waiting plan has been adopted, the head has moulded and delivery by forceps has failed when attempted earlier.

The results for the mother in either operation should be the same, if it is done or attempted by one who is familiar with its dangers and is ordinarily skilful.

In the whole series of one hundred and forty-six cases, forceps were applied twenty-four times, and podalic version was performed thirty-three times.

The thirty-three version operations include six cases in which forceps had been attempted and had failed. The results of these operations can be seen by comparing forceps with version in parallel columns.

Forceps.					Version.				
No.	Conj. Vera.	Mother.	Child.	Remarks.	No.	Conj. Vera.	Mother.	Child.	Remarks.
1	?	Recov'd.	Recov'd.	Fractured child's skull.	1	3¼	Recov'd.	Recov'd.	Prolapsed cord; lacerated perineum.
2	3¼	"	"	Cephalic version for shoulder pres.	2	3¼	"	"	After symphysiotomy.
3	3¼	"	"	Lacerated perineum.	3	3¼	"	"	After symphysiotomy; perineorrhaphy.
4	3¼	"	"		4	3	"	"	After symphysiotomy; fractured humerus.
5	?	"	"	Albuminuria	5	3¼	"	Died ...	After forceps.
6	3¼	Died	"	Albuminuria and fever.	6	3¼–¼	"	Recov'd.	Prolapsed cord.
7	3¼	Recov'd.	"		7	3¼	"	"	
8	3¼	"	"	Trachelorrhaphy.	8	3¼	"	"	After symphysiotomy.
9	3¼	"	"	"	9	3¼	"	"	" "
10	?	"	Still	Consultation case.	10	3¼	"	"	2 years after symphysiotomy.
11	3¼	"	Died	Occiput posterior.	11	3¼	"	"	Shoulder presentation.
12	3¼	"	Recov'd.		12	3¼	"	"	Face presentation.
13	3¼	"	Still	" "	13	?	"	"	Contracted outlet; symphysiotomy; brow; perineorrh.; attempted forceps.
14	3¼	"	Died						
15	3¼	"	Recov'd.						
16	3¼	"	"	" "					
17	3¼	"	Still	" "					
18	3¼	"	Recov'd.						
19	3¼	"	"						
20	3¼	"	"						
21	3¼	"	"	Manual dilatation of cervix.	14	3¼	"	"	Perineorrhaphy.
					15	3¼	"	"	Trachelorr.; perin.
22	3¼	"	Still	Occiput posterior; manual dilatation.	16	3¼	"	"	
					17	3	"	Died	Depression child's skull.
23	3¼	"	" "	Occiput posterior.	18	3¼	"	Recov'd.	Attempted forceps.
24	3¼	"	Recov'd.		19	3¼	"	" "	
					20	3¼	Died	Still	Fever.
					21	3¼	Recov'd.	"	Prolapsed cord; attempted forceps.
					22	3¼	"	"	Attempted forceps; depression child's skull.
					23	3¼	"	"	Prolapsed cord.
					24	3	"	" . ..	Craniotomy, after-coming head.
					25	3¼	"	"	Depression child's skull.
					26	3¼	"	"	Child macerated.
					27	3¼	"	Living ..	Prolapsed cord.
					28	3¼	"	Still	Extended after-coming head.
					29	3¼	"	"	Prolapsed cord; fractured humerus.
					30	3¼	"	"	Prolapsed cord.....
					31	3¼	"	"	
					32	3¼	"	"	
					33		Died	Living ..	Uræmia; rigid coccyx.

The results shown by the preceding table are as follows:

Three deaths of mothers.

Twenty-one deaths of children.

The causes of the maternal deaths need not be repeated, as they have already been described in detail; and, with the exception of one, they could not have been caused by the operation.

Of the twenty-one deaths of children, seven were after forceps and fourteen after version operations.

It is necessary to go into details in order to explain such an apparent superiority in the results after forceps. The increased number of deaths

in the version column may be partially explained by the fact that there were nearly one-third more version operations. Again, six of the versions were undertaken after forceps had been tried and had failed, and three of the deaths were of these six. In one of these, death was distinctly due to forceps, it having been found that the cord had prolapsed and was pinched between the head and forceps blade.

It is significant, also, that deformity was more marked in the version cases than in the forceps cases. In the former, twenty-six had a conjugate below $3\frac{1}{4}$ inches, while only five such cases occurred in the forceps deliveries. In other words, nearly all the forceps deliveries were in moderately deformed pelves as compared with the cases of version deliveries.

If the column of "Remarks" be examined for a probable explanation of a still birth, in each instance it will be found that there were no complications in the forceps cases other than occiput posterior positions, which were present in five of the seven. Of the still births after version, death was due to causes other than the version, as follows:

1. Depression of child's skull in three cases, with a conjugate of 3 inches in one case, and $3\frac{1}{4}$ in another (complicated with forceps), and $3\frac{1}{4}$ in a third.

2. Prolapse of cord in three cases.

3. Arrest of the head necessitating a craniotomy in a case in which the pelvis measured but three inches.

4. A macerated child in still another case.

Taking into account the accidental complications, and the more pronounced pelvic deformity, the results as regards the child are more favorable after version than after forceps.

Given a case of deformed pelvis in which the disproportion is not sufficiently great to preclude the possibility of extracting a living child, in the majority of instances version is the better operation from all points of view.

I do not think that it would be occupying an extreme position to say that forceps should never be applied to the head when it is movable above the brim, in cases of pelvic deformity. There is only one condition that might be an exception to this rule. When the patient is seen after the membranes have ruptured, the amniotic fluid drained away, and the uterus is tightly contracted about the child, cautious attempts may be made to engage the head with forceps. Failing in this, delivery can only be accomplished by a difficult version or a more radical operation. Such a condition can only occur when the disproportion is great.

Such varied conditions may be present in any given case, that no rule can be made that is absolute. For the general practitioner, version is safer, is easier, and gives better results in cases of pelvic deformity than forceps. For the practitioner skilled in midwifery, the same rule will hold good in the majority of cases. Face to face with other complications, he should be capable of making rules for his own guidance.

Special training and experience will often enable an operator to overcome difficulties insurmountable to another, whether the operation be forceps or version.

CÆSAREAN SECTION IN A RACHITIC DWARF.

By James W. Markoe, M.D.

Previous History.

C. N. 5,506.—The patient, a primipara, thirty-four years of age, was born in Poland, and came to this country but three months ago. She states that when nine months old she first began to walk, and was perfectly well and strong until reaching the age of two years, when she was badly scalded upon the left arm and side. From the description of what followed, rickets evidently developed, she being unable to walk again until her seventh year. Since that time, she has always been well, except for deformity. Menstruation began at fourteen, and has always been normal in character and duration.

Examination.

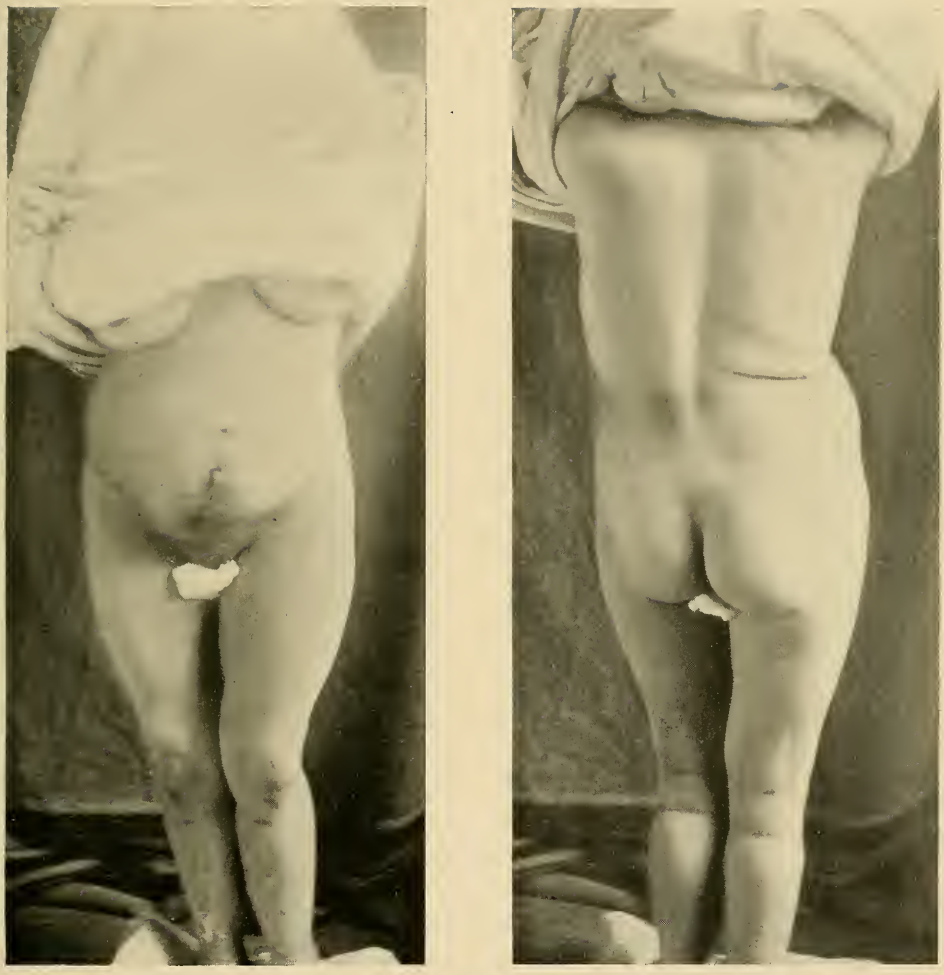
Dr. T. Halsted Myers examined the patient and reported as follows:

"A rachitic dwarf, fifty inches in height, with marked rotary lateral curvature of the dorso-lumbar spine. The vertebræ from the ninth dorsal to the fifth lumbar were markedly deformed. The lateral deviation amounted to one inch, and this brought the ribs on the right side against the iliac crest, while on the left they were two inches above it. The posterior rotation of the lower ribs as the patient stooped forward was two and a half inches. The lumbar spine showed less than the normal lordosis. The sacrum seemed very flat, and its anterior concavity less than normal. The inclination of the pelvis to the horizontal plane was 56¼ degrees.

Measurements of Pelvis.

	Inches.	Cent.
Anterior superior spines	9½	24
Crests	10	26
External obliques (both)	8	20½
" conjugate	5¾	14½
Diagonal conjugate	4	10
True conjugate	3	7½
Height of symphysis	2	5

"The rachitis had produced a pseudo-paralysis for a long time, therefore the lower limbs were but little deformed. Both femora showed some anterior curvature, and there was slight knock knee and flat foot on the left side. The upper extremities were well formed, but dwarfed."



Case of Cæsarean Section.

C. N. 5,506.

Case of Cæsarean Section.

C. N. 5,506.

After consultation with the other members of the attending staff, Cæsarean section was decided upon as the only chance for the mother and child. As she was in the ninth month of pregnancy, nothing was to be gained by operating immediately. When labor should commence was chosen as the time for the operation.

It is but fair to state that every effort was made to induce the patient to go to a hospital, the advantages being explained to her most carefully, but to no avail.

Operation.

December 24, 1893, in the front room of third-floor apartment of a tenement at 84 Norfolk Street, Sanger's operation was performed.

No attempt was made to clean the room, but as perfect asepsis as possible was observed with everything that came directly in contact with the patient.

Ether was started at 11.25 A.M.; uterus lifted out of abdominal cavity, 11.54; child and placenta delivered, 11.56. Last suture in uterus, 12.16 P.M.; last abdominal suture, 12.56. Operation lasted 1 hour and 11 minutes. Silk was used for all sutures; sterilized water for washing and irrigation purposes. Dressed with strip of iodoform gauze, then sterilized gauze held in place by firm binder.

Patient rallied quickly from ether, but on following day developed severe cough with profuse purulent expectoration. On the night of the fifth day, her temperature reached 101.2 degrees; pulse, 124; respiration, 28. Bowels were moved by enemas, and the cough controlled by small doses of codeine and muriate of ammonia. On the sixth day, as temperature remained up, it was thought advisable to dress the wound, and, upon doing so, a small drop of pus was pressed from second lower stitch. This was, therefore, removed and well washed. Temperature, one hour later, 101 degrees, largely due to the very nervous condition of the patient.

On the seventh day the lochia was scant, and composed of mucus and pus. All the abdominal sutures were removed, and an intrauterine douche given of weak bichloride solution. Patient being very unruly and complaining of pain in right chest, physical signs showed simply an extensive bronchitis. On the eighth day a small stitch abscess at the site of third stitch was opened with scissors, and irrigated with peroxide of hydrogen. Patient's general condition satisfactory, appetite very good, and sleep much improved. Cough is troublesome, and expectoration purulent and profuse. From this time on, patient steadily improved. Douches were given every day, and her general condition built up with cod-liver oil and iron.

At the end of four weeks, patient walked to the Dispensary perfectly well.

The child was bottle-fed from the beginning, but was a remarkably healthy baby until the summer of 1895, when it died of some diarrhœal disorder, the mother failing to notify the Hospital until after its death, some local physician having been called in.

An examination of the mother two and one-half years after the operation reveals uterus of normal size, drawn well up in the pelvis by adhesions to the anterior abdominal wall. Menstruation is regular, and her only trouble seems to be the loss of her child and an inability to become pregnant again.

PREGNANCY AND LABOR FOLLOWING ALEXANDER'S OPERATION.

By James W. Markoe, M.D.

Previous History.

C. N. 1,705.—An English woman; age 29 years; III. para; married; first menstruation at twelfth year; always regular; after the fourteenth year accompanied with pain; general health was otherwise very good until she married, when there developed a leucorrhœa, to relieve which she entered a hospital and was operated upon; thereafter her symptoms improved. Her history since marriage shows one miscarriage before the operation, and one after. The dates of these or the duration of pregnancy were not ascertained.

History of Present Pregnancy.

Last menstruation on June 27, 1891; first felt fœtal movements in the latter part of September; on October 6, 1891, she applied to this Hospital for care during her coming confinement. The examination at this time revealed two scars two inches long, directly over the inguinal canal; uterus drawn forward, with greatest diameter transverse; measurements of pelvis normal; patient's general condition good, but complained of dragging pains radiating upward from scars. General condition anæmic and weak.

Record of Labor.

Regular pains began about 11 o'clock P.M., April 14, 1892, and were very severe from the beginning; face presentation; position L. M. P.; at 2 o'clock A.M., April 15th, the membranes ruptured spontaneously; chloral hydrate and morphine were given to control the excessive pain, which she referred to the course of round ligaments. April 16, 1892, at 12 o'clock P.M., forceps were applied above the brim, but with considerable force no advance could be made: they were removed, and podalic version performed under ether to surgical degree.

The child, a male, weighing about eight and one-half pounds, was delivered without much difficulty; but although its heart beat for some time afterwards, respiration was never established. The mother made an uninterrupted recovery.

VERSION.

By Austin Flint, Jr., M.D.

Among the 10,233 cases delivered by the Hospital, exactly 207 were delivered after a version operation.

This is a frequency of one in 49.43 cases. Among the 207 cases observed, twins occurred 15 times, making a total of 222 children delivered. In some instances cephalic version was done during pregnancy; in one instance it was performed twice, and the case finally delivered after a podalic version. Including twin cases and the instances in which version was performed more than once, there were 214 operations performed. Of these, 14 were cephalic and 200 podalic versions.

All of the cephalic versions were done by the external method, with one exception, done by the combined method, and nearly all the podalic versions were done by the internal method. These operations were performed in tenement houses, often in desperate cases, and under the worst possible surroundings. Many of them had previously been under the care of midwives, or of physicians not connected with the Hospital, and had been subjected by them to manipulations and operations which had not been successful. In each instance, careful antiseptic precautions were observed, but the patients were without the advantages of skilled nursing subsequent to delivery, which has such an important influence on the ultimate results. This is especially noticeable in the results for the children, many of whom would undoubtedly have survived had they been born in a well-appointed hospital.

The operations were performed for a great variety of causes, and in cases presenting complications, including almost all of the more common accidents in midwifery.

I have made a table of all the version cases, which contains so much that cannot be shown to advantage in any other way, that it is published as it is. (See pages 277–278.)

In the 214 cases tabulated, the presentation and position are recorded as follows:

Presentation.

	Cases.		Cases.
Shoulder	86	Ear	1
Vertex	102	Arm, foot, and cord	1
Transverse	4	Transverse, feet and cord	1
Face	7	Not noted, including twins	14
Breech	4		
Brow	2	Total	222

Position.

	Cases.		Cases.
L. O. A.	63	L. O. P.	2
L. Scap. A.	25	L. Sacrum P.	2
R. Scap. A.	25	L. Sacrum A.	1
R. O. A.	18	R. M. P.	1
R. Scap. P.	13	L. M. A.	1
R. O. P.	13	R. M. A.	1
L. Scap. P.	11	Not noted, including twins.	42
L. M. P.	4	Total	222

The complications, as can be seen by referring to the large table, are so numerous, that it is difficult to tabulate them or to separate them from the indications. In many cases, the most serious of the conditions present is put down as the indication, and the less serious condition under the head of "Complications." For example, a placenta prævia complicated by a shoulder presentation and a prolapse of the cord has occurred several times. To this might be added a slight pelvic deformity as a complication, if it *were* slight, or as the indication, if it were serious.

A list of indications and complications has been made, but this might be changed by one who considered the complication of more importance than the indication, or *vice versâ*.

Before tabulating the complications and indications in the cases of podalic version, a brief summary of the cases of cephalic versions will render the tabulation of the others more simple.

There were fourteen such operations. The indications and results were as follows:

1. For shoulder presentation, followed by forceps, which were unsuccessful, and the case was finally delivered by podalic version.

2. For shoulder presentation performed twice during pregnancy, after which the cord prolapsed, and delivery was accomplished after podalic version.

3. For transverse presentation, followed by prolapse of the cord and podalic version.

4. In a twin case, the second child being changed from a breech to a vertex.

5. Also for a breech presentation in a twin case.

6. Twin case, cephalic version attempted, delivery by podalic version.

7. Breech presentation, changed to vertex.

8. Twins, second child transverse, changed to vertex.

9. For a shoulder presentation in a Naegele pelvis, followed by forceps.

10. For a shoulder presentation in a case of placenta prævia, followed by podalic version.

11. For a shoulder presentation, done six weeks antepartum.

12. For a transverse presentation, changed to a vertex.

13. Breech presentation changed to vertex.

With case number two counting as two operations, cephalic version was

	C. N.	Presentation.	Position.	Para.	Apec.	Month of Gest.	Indications.	Complications.	Method of Extraction of After-coming Head.	Result. Mother.	Result. Child.	Foetal Heart.
Podalic ...	36	Shoulder.....	R. Scap. P.	X.	36	?	Shoulder; placenta prævia; prolapsed cord..	Extended arms; right humerus fractured; cervix incer.	Both feet seized; right hand.....	Living; temperature 101°	Living.....	Not heard.
"	141	"	R. Scap. A.	III.	7	9	Shoulder presentation	Prolapsed hand; ring of Bandl contracted	Left foot seized; " "	" fever.....	Still-born.....	" "
"	302	"	L. Scap. A.	VIII.	33	7	" "	Placenta prævia; immaturity.....	" " " "	" well.....	Living.....	" "
"	255	"		VI.	32	9	" "	Prolapsed cord (forceps)	" " " left "	"	"	Strong.
"	330	"		VIII.	38	...	" " ..... uræmia	Midwife case			"	Child died 5th day.
"	340	Transverse		II.	24	8½	Transverse	Placenta prævia	Right foot	Died 24 hours postpartum	Still-born	Not heard.
"	420	Vertex	R. O. A.	I.	24	9	Hydrocephalus.....	Perineum torn (forceps tried)	Forceps to after-coming head	Living; died 4d day	Living.....	"
"	426	Shoulder.....		I.	7	9	Shoulder; prolapsed arm and right leg.	Midwife and outside physician had failed to deliver case	Right hand	Died 1 hour postp.; shock	Still-born	" "
"	444	"	R. Scap. P.	IV.	33	9	Shoulder; prolapsed arm.....	.....	Right hand and left foot seized.....	Living; well.....	Living.....	140.
Cephalic.	676	"	R. Scap. A.	V.	30	9	Forceps failed	Cephalic and forceps, contracted pelvis.....	Delivered by podalic version	" recovery.....	Still-born	Not heard.
Podalic ...	769	"		V.	27	9	Shoulder presentation	{ Mother suffered from hæmorrhage and shock from } { growths on cervix..... }	Right hand and left foot.....	Died 5 hours postpartum.	"	" "
"	825	"	L. Scap. A.	VII.	30	9	" "	" "		Living; well.....	Living.....	
"	885	"		III.	23	9	" "	Right arm and leg extended; prolapsed cord.	Left foot.....	"	Still-born	Cord pulsating.
"	939	"		II.	27	6	Placenta prævia and hæmorrhage.....	Twins, immature.....	Heads pulled off by grasp of cervix.	"	Both still-born.....	" "
"	951	Vertex	L. O. A.	IV.	31	9	Prolapsed cord	Hydramnion.....	Left foot	"	"	" "
"	1,036	Breech & vertex.	{ L. S. A. } { L. O. A. }	I.	24	9	Prolapsed cord, second child	Phthisis; twins	Right foot	" fever.....	Living.....	Not heard.
"	1,037	Shoulder.....	L. Scap. A.	V.	28	9	Shoulder presentation	Prolapsed feet and cord.....	Both feet; left hand	"	Both living	136.
"	1,163	Vertex	L. O. P.	I.	21	9	.....	Contracted pelvis; forceps failed	Right foot; right hand.....	" well.....	Living.....	140.
"	1,175	"	L. O. A.	IV.	28	7	Prolapsed cord; contracted pelvis.....	Cord ceased to pulsate before version.....	.....	" fever	Still-born	145.
"	1,191	Face	R. M. A.	III.	37	9	Prolapsed cord, second twin.	Attempt to flex head.....	Posterior foot; left hand.....	" well.....	Still-born; skull depressed	136.
"	1,198	Vertex		VI.	36	5–6	Placenta prævia.....	Ruptured uterus and immaturity.....	Tamponed by outside physician.....	Died 36 hrs. postp.; hæm.	Still-born	Not heard.*
Cephalic.	1,210	Shoulder.....		XII.	39	9	Prolapsed cord	Cephalic version twice, after which, podalic		Living; fever.....	Living.....	144.
Podalic ...	1,253	"		III.	21	9	Shoulder presentation	Both arms and head extended.....		" well.....	"	
Cephalic.	1,280	{ Transv. and }		II.	24	9	Prolapsed cord; head not engaging.	Cephalic version, followed by podalic.....		"	"	Good.
Podalic ...		{ then vertex. } { L. O. A. }										
"	1,331	Shoulder.....	R. Scap. P.	I.	30	9	Shoulder and right hand.....	Prolapsed cord.....	Right hand; left foot+	" fever.....	Still-born	Not heard.
"	1,424	Vertex	R. O. A.	IV.	23	9	Prolapsed cord; pulsation feeble	Both arms extended		"	"	142.
Cephalic.	1,475	Shoulder.....	R. Scap. P.	X.	38	9	Shoulder and breech.....	Twins { First, shoulder; podalic version..... } { Second, breech; cephalic version..... }		"	Both living.....	Not heard.
Podalic ...	1,554	"	L. Scap. A.	I.	30	9	Shoulder presentation	Prolapsed cord	Right hand; right foot	" well.....	Still-born	129.
"	1,573	Breech	L. S. A.	II.	22	9	Breech; displacement of fœtal parts.....	{ Twins; one delivered by manual extraction of } { breech; and the other by cephalic version. }		"	Both living	
"		{ Vertex, 1st }										
Cephalic.	1,629	{ twin, trans., }		I.	30	?	Second twin, prolonged labor	Cephalic version, followed by podalic		"	{ Still-born ..... } { Living..... }	
Podalic ...		{ 2d twin. }										
"	1,705	Face	L. M. P.	III.	29	9	No advance.....	High forceps and previous Alexander's operation ...	Left hand.....	"	Still-born	138.
"	1,738	Shoulder.....	L. Scap. P.	II.	32	9	Shoulder presentation	{ Right arm partially extended; placenta prævia; } { cord prolapsed during extraction ..... }	Right hand.....	"	Living.....	Heard.
"	1,751	"		II.	18	7	" "	Placenta prævia; arms extended.....	Left hand.....	"	Still-born	Not heard.
"	1,752	"	R. Scap. P.	I.	25	9	" "	Prolapsed cord; arms extended.....	Forceps to after-coming head	"	"	Heard.
"	1,856	"		IV.	36	8	" " ..... prolapsed hand	Asphyxia in child.....		"	Living.....	Not heard.
Cephalic.	1,872	Breech	L. S. A.	XII.	38	9	.....	.....	External cephalic version and binder.....	"	Still-born	139.
Podalic ...	1,899	Shoulder.....	L. Scap. P.	IV.	24	9	" " ..... prolapsed cord	Prolapsed arm.....	One leg.....	"	Living.....	Heard.
"	2,081	Face	L. M. P.	VI.	35	9	" " ..... inconvertible.....	Extended arms; small pelvis		"	Still-born	Heard in 1st stage,
"	2,114	Shoulder.....	R. Scap. A.	IX.	...	9	.....	.....		"	Living.....	not in 2d.
Cephalic.	2,142	"	L. Scap. A.	III.	30	9	Second child transverse	Twins.....	External cephalic version.....	"	{ Both ..... }	
Podalic ...	2,170	Vertex	L. O. A.	VIII.	34	9	No record, ...	No record (tedious).....		"	"	
"	2,182	Shoulder.....	R. Scap. A.	I.	28	9	Shoulder presentation; placenta prævia.....	One leg and arm extended.....		"	Still-born	Heard.
"	2,237	"		VII.	37	9	" "	Arms extended		"	Living.....	Not heard.
"	2,242	"	L. Scap. A.	III.	30	9	" "	Legs extended; arms extended.....		"	"	" "
"	2,284	Face	R. M. A.	III.	38	9	Position persistent; no progress	Arms extended and locked.....		"	Still-born	Heard.
"	2,338	Shoulder.....	R. Scap. P.	III.	39	9	Shoulder presentation	Head caught by undilated cervix		"	Living.....	Not heard.
Cephalic	2,362	"		IV.	39	8	" "	Naegele pelvis	External operation, followed by forceps.	"	"	124.
Podalic	2,401	"	R. Scap. P.	V.	29	9	" "	Arms extended and locked.....		"	"	
"	2,490	"	L. Scap. P.	VII.	32	9	" "	Impacted shoulder; dry labor.....		"	Living.....	Not heard.
"	2,521	Face	L. M. P.	VI.	28	9	" "	Arms extended		"	"	" "
"	2,570	Vertex	L. O. A.	IX.	34	9	{ Mother in collapse; previous forceps, and } { laceration of cervix. }	Arms extended.....		Good recov'y from ether.	Still-born.....	" "
"	2,720	"	"	IX.	36	9	Prolapsed funis			Living; well.....	Living.....	
"	2,722	"	R. O. A.	I.	30	9	Albuminuria.....	Induction of labor.....		"	"	
"	2,731	"	L. O. A.	IV.	36	...	Exhaustion; tedious labor.....	Extended arm		"	"	
"	2,769	"	"	V.	38	9	{ Prolonged first stage; deformed pelvis; } { craniotomy on after-coming head. }	Extended arms.....		"	Still-born	
"	2,847	Shoulder	L. Scap. P.	...	...	9	Shoulder presentation	Arms extended.....		"	Living.....	
"	2,876	"	R. Scap. A.	VII.	36	9	" "	Arms and legs extended		"	Living.....	
"	2,901	Vertex	L. O. A.	VIII.	35	9	Prolapsed cord	Arms extended		"	"	
"	3,207	"		VI.	34	9	Shock; ruptured uterus.....	As inclosed	Pod. vers.; rupt. uterus; right hand; both feet	Died 36 hours postpartum	Still-born	
"	3,275	Shoulder	L. Scap. A.	IV.	28	9	Presentation	Prolapsed arm; shock, two hours postpartum.....	Right hand; both feet	Living; shock	Living.....	136.
"	3,303	Vertex	L. O. A.	IV.	37	9	Prolapsed pulseless cord.....			" fever.....	Still-born	Not heard.
"	3,311	"	R. O. P.	II.	23	8	Prolapsed cord and ruptured uterus.	Occipito-posterior position		Died 4 hours postpartum.		
"	3,354	Shoulder	R. Scap. P.	IV.	...	9	Shoulder presentation	Prolapsed arm		Living; well.....	Living.....	129.
"	3,394	Brow.....	R. O. A.	V.	31	9	Prolonged labor; brow presentation.....	High forceps; arms extended.....	Left hand; right foot	"	" microcephalic idiot	128.
"	3,411	Vertex	L. O. A.	IV.	35	9	{ Weak pains; presentation changing to } { R. S. P.; and arm prolapsed. }	.....		"	"	140.
"	3,463	"	"	I.	24	9	Prolapsed cord.....	Contracted pelvis.		"	"	132.
"	3,466	Shoulder	L. Scap. A.	VI.	32	9	Shoulder presentation; placenta prævia.....	Both arms extended; fractured humerus in child...	One leg	"	"	
"	3,477	"	"	V.	30	9	" " ..... prolapsed cord			"	"	159.
"	3,507	Arm, foot, cord		III.	40	9	Presentation	Extended arms and legs.....		"	"	Heard.
"	3,562	Shoulder	L. Scap. P.	VII.	30	9	Shoulder pres.; hæm.; placenta prævia; shock.	.....	Left hand; left foot	Died 4 to 5 hrs. postp.	Died 25 min. postpartum.	"
"	3,595	"	R. Scap. P.	IV.	33	8	Shoulder presentation; placenta prævia.....	.....	Right hand	Living; well.....	Living.....	140.
"	3,601	Vertex	R. O. A.	I.	18	9	Contracted pelvis	{ Head became wedged between promontory and } { symphysis; child's skull fractured ..... }		"	Still-born	134.
"	3,639	"	"	X.	34	10	Severe pains; no advance.....	Forceps attempted		"	"	128.
"	3,634	"	L. O. A.	II.	25	9	Prolapsed cord	Arms extended.....	One foot.....	"	"	132.
"	3,671	"		II.	25	9	Placenta prævia.....	Hæmorrhage severe		" fever.....	Living.....	140.
"	3,678	"	R. O. P.	II.	28	9	Weak pains (second twin)	Twins; forceps; albuminuria; occipito-posterior pos.		" well.....	"	
"	3,679	Shoulder.....	R. Scap. A.	II.	30	9	Shoulder presentation	Prolapsed arm		"	"	
"	3,692	Vertex	L. O. A.	I.	24	9	Contracted pelvis (symphysiotomy)	Failure forceps.....		" fever.....	"	140.
"	3,833	"	R. O. P.	III.	22	10	Prolapsed arm	Twins; occipito-posterior position	Right hand; one foot	" well.....	"	136.
"	3,870	"	L. O. A.	II.	22	8	Placenta prævia	Hæmorrhage.....		"	"	
"	3,882	"		VIII.	42	9	No record	"		"	"	Not heard.
"	3,885	Shoulder.....	R. Scap. P.	VIII.	30	9	Shoulder presentation	"		"	Still-born	" "
"	3,940	"		I.	30	9	" "	"		"	"	" "
"	3,948	Vertex	L. O. A.	III.	25	7	Placenta prævia	Hæmorrhage; prematurity.....		" fever.....	Living.....	134.
"	3,983	Shoulder.....	L. Scap. A.	VIII.	29	9	Shoulder presentation	.....		"	Still-born	Not heard
"	3,990	Vertex	L. O. A.	VI.	38	9	Hæmorrhage (severe)	.....		" well.....	Living.....	"
"	4,030	Shoulder.....		VI.	30	9	Shoulder presentation	.....		"	"	142.
"	4,048	"	L. Scap. A.	V.	38	9	.....	Arms extended.....		"	"	140.
"	4,112	"	"	IV.	36	9	Prolapsed cord.....	.....		"	"	Not heard.
"	4,209	"	?	V.	33	9	Shoulder presentation; prolapsed cord.....	Left arm extended; fractured.		"	"	" "
"	4,263	Vertex	L. O. A.	IV.	43	8	Placenta prævia	Hæmorrhage; prematurity.....		" fever.....	"	140.
"	4,549	"	R. O. A.	III.	27	9	Deformed pelvis; prolapsed cord.....	Fractured humerus in child; suspended animation.....		" well.....	"	136.
"	4,564	"	"	IV.	30	9	Prolapsed cord; pulsations weak.....	Arms extended		"	"	
"	4,756	"	R. O. P.	VI.	34	9	.....	Right arm extended; occipito-posterior position.....		"	Still-born	144.
"	4,800	"	R. O. A.	III.	29	8	Placenta prævia and hæmorrhage	"		" fever.....	Living.....	150.
"	4,879	Shoulder.....	L. Scap. P.	IX.	34	8	Shoulder presentation	Right arm extended.....		" well.....	"	145.
"	4,912	Vertex	R. O. A.	I.	24	9	Prolapsed funis	.....		"	"	60.

* First child, R. O. A.; second child, face; attempt to flex caused prolapse of cord.

† Attended for two hours before labor by midwife.

	C. N.	Presentation.	Position.	Para.	Age.	Month of Gest.	Indications.	Complications.	Method of Extraction of After-coming Head.	Result. Mother.	Result. Child.	Foetal Heart.
Podalic	4,989	Shoulder	R. Scap. A.	VI.	36	9	Shoulder presentation; prolapsed cord & arm.			Living; well	Living	72-120.
Cephalic / Podalic	5,066	"	"	II.	19	8	Placenta prævia		Combined (bipolar) cephalic	" "	Still-born	Not heard.
"	5,128	Vertex	L. O. A.	IV.	32	9	Prolapsed cord			" "	Living	Irregular.
"	5,168	"	"	I.	19	9	Contracted pelvis; failure forceps	Symphysiotomy		" fever	"	Not heard.
"	5,305	"	"	VII.	32	7½	Failure forceps	Induced labor		" "	"	" "
"	5,210	"	"	I.	27	9	Prolonged labor; no advance	Arms ext.; rigid cervix; forceps to after-coming head		" "	Still-born	" "
"	5,324	Shoulder	L. Scap. A.	X.	30	8½	Shoulder presentation	Prolapsed arm		" "	Living	" "
"	5,413	"	"	VIII.	32	9		Left arm extended; arm fractured		" well	"	144.
"	5,456	Vertex	L. O. A.	VII.	30	9	Deformed pelvis; foetal heart weak	Hæmorrhage		" "	Still-born	140.
"	5,462	Shoulder	L. Scap. A.	X.	37	9	Shoulder presentation			" "	Living	Not heard.
"	5,473	Vertex	L. O. A.	XII.	38	7	Failure induced labor	Postpartum hæmorrhage; prematurity		Died; hæmorrhage	Living; died postpartum	Heard.
"	5,509	"	"	I.	27	9	Failure pains and forceps	Twins		Living; well	Both living	
"	5,515	"	"	IX.	35	9	Weak pains; albuminuria and œdema			" "	Living	
"	5,564	Shoulder	R. Scap. A.	II.	25	9	Shoulder presentation	Arms extended		" "	"	
"	5,586	"	L. Scap. A.	IV.	28	9	" " prolapsed cord	Twins; extended arms		" fever	"	
"	5,610	Vertex	R. O. A.	II.	25	9	Contracted pelvis; symphysiotomy	Fractured humerus in child		" well	"	144.
Cephalic	5,670	Shoulder	R. Scap. A.	X.	29	9	Shoulder presentation	Done six weeks antepartum by external method		" "	"	
Podalic	5,672	"	R. Scap. P.	III.	30	9	" "	Arm prolapsed	Both feet	"	"	Not heard.
"	5,696	"	R. Scap. A.	VIII.	25	9	" "	" postpartum hæmorrhage; pneumonia	"	Died postpartum: hæm.	"	Heard.
"	5,694	Vertex	L. O. A.	III.	30	9	Prolapsed hand		Right foot	Living	"	
"	5,718	"	"	V.	29	9	Prolapsed cord	Arm prolapsed	"	"	"	150.
"	5,723	Shoulder	L. Scap. P.	V.	38	9	Shoulder presentation	" "	Both feet	"	"	Not heard.
"	5,704	"	L. Scap. A.	VII.			" "	Prolapsed arm and cord	"	"	Still-born	
"	5,709	Vertex	L. O. A.	III.	24	9	Deformed pelvis	Ext. arms; hæmorrhage; uræmia; threatened eclampsia		Died 25 days p.p.; pneum.	Living	" "
"	5,817	"	"	V.	46	9	Prolapsed arm and hand	Fractured humerus in child		Living	"	
"	5,839	"	R. O. P.	I.	23	9	Exhaustion; weak fœtal heart	Postpartum hæmorrhage; occipito-posterior position		" fever	"	160.
"	5,824	Shoulder	L. Scap. A.	III.	35	9	Shoulder presentation	Prolapsed hand and arm; developed pneumonia		Died 10 days p.p.; pneum.	"	Heard.
"	5,802	"	R. Scap. A.	IV.	45	9				Living	Still-born	Irregular.
"	5,863	Vertex	R. O. A.	IV.	23	9	Prolapsed cord			" fever	Living	Not observed.
"	5,851	Shoulder	L. Scap. A.	VIII.	33	9	Shoulder presentation			" "	"	140.
"	5,957	Vertex	R. O. P.	IV.	27	9	Prolapsed cord	Occipito-posterior position		" "	"	142.
"	6,009	"	L. O. A.	VII.	35	9	"	Deformed pelvis		" "	"	144.
"	6,049	"	L. O. P.	III.	29	9	Deformed pelvis; weak fœtal heart	Occipito-posterior position; exhaustion in mother		" "	Still-born	140; weak.
"	6,043	"	R. O. P.	XII.	38	9	Hydrocephalus	" "		" fever	"	145.
"	6,057	"	L. O. A.	II.	27	9	Deformed pelvis	Left arm extended; mother exhausted		" "	Died 1st day postpartum	140.
"	6,067	"	"	XIII.	38	9	Prolapsed cord	Mother intoxicated		" fever	Living	150.
"	6,085	"	R. O. P.	IX.	43	9	Deformed pelvis	Occipito-posterior position		" "	Still-born	Not heard.
"	6,096	"	L. O. A.	V.	28	9		Prolonged labor (66 hours); membranes ruptured 3 days		" fever	"	180; feeble.
"	6,119	"	"	I.	19	9	Eclampsia; prolapsed cord	Arms extended		" "	Living	Not observed.
"	6,122	Shoulder	L. Scap. A.	III.	30	9	Shoulder presentation	Prolapsed arm		" "	"	150.
Cephalic	6,158	Transverse		II.	28		Presentation			" "	"	
Podalic	6,251	Vertex	L. O. A.	I.	35	9	Placenta prævia; hæmorrhage	Prolapsed arm	External cephalic during pregnancy	" "	Still-born	160.
"	6,233	"	R. O. P.	II.	30	9	Eclampsia	Plural births (twins)	Temperature of mother 103°	Died 7 hours postpartum	Living	Not heard.
"	6,467	Shoulder	R. Scap. A.	IX.	35	9	Shoulder presentation	Twins		Living	"	144.
"	6,505	Vertex	R. O. A.	IV.	28	9	Prolapsed cord	"		"	"	Not observed.
"	6,570	"	"	V.	36	9	" "			"	"	138.
"	6,693	"	L. O. A.	VIII.	33	9	" "	Deformed pelvis		"	"	148.
"	6,012	"	"	IV.		9	Deformed pelvis (justo-minor)			"	"	150.
"	6,776	"	"	IX.	37	9	Prolapsed cord			"	"	130.
"	6,823	"	"	IX.		9	Prolapsed arm			"	"	140.
Cephalic	6,829	Breech		III.	24	9	Breech presenting changed to vertex, during pregnancy, by external method.			"	"	
Podalic	7,057	Vertex	L. O. A.	III.	24	9	Exhaustion mother	Arms extended		"	Died 6th day postpartum	144.
"	7,059	"	"	II.	26	9	Eclampsia	Incision of cervix; hæmorrhage		"	Living	144.
"	7,079	"	"	VII.	32	9	Uterine inertia and eclampsia			"	"	140.
"	7,148	Shoulder	L. Scap. P.	VI.	20	9	Shoulder presentation	Hydramnion		"	Still-born	144.
"	7,178	Vertex	L. O. A.	III.	24	9	Prolapsed arm; weak fœtal heart	Twins (version on second)		" fever	Living	144.
"	7,181	"	"	II.	38	9	Eclampsia (convulsions)			"	Still-born	Not heard.
"	7,193	Shoulder	R. Scap. A.	VI.	31	9	Shoulder presentation			"	Living	152.
"	7,198	Vertex	"	IV.	35	9	Deformed pelvis	Symphysiotomy		" fever	"	144.
"	7,230	"	R. O. P.	II.	25	9	Def. pelvis; exh. mother; weak fœtal heart	Persistent occipito-posterior position	Patient sent to Bellevue	" "	"	170-170.
"	7,293	"	R. O. A.	XV.	41	9	Prolapsed cord	Ruptured uterus		Died 6th day postpartum	Still-born	Not observed.
"	7,384	"	L. O. A.	I.	19	9	Deformed pelvis	Symphysiotomy		Living	Living	144.
"	7,459	Shoulder	L. Scap. A.	IV.	25	7½	Shoulder presentation	Prolapsed arm; hæmorrhage; prematurity		"	Still-born	Not heard.
"	7,169	Vertex	L. O. A.	V.	30	9	Placenta prævia	" cord		" fever	Living	" "
"	7,571	Shoulder	R. Scap. A.	II.	25	9	Shoulder presentation	" arm		"	"	120.
"	7,570	Bar		II.	20	9	Flat pelvis; presentation	Symphysiotomy in previous pregnancy, 1893		"	Still-born	145.
"	7,615	Vertex		III.	37	9	Deformed pelvis; prolapsed cord	Extended arms; left arm fractured		" fever	Living	Not heard.
"	7,678	Shoulder	R. Scap. A.	I.	22	9	Shoulder presentation	Deformed pelvis (justo-minor); mother pneumonia		"	"	140.
"	7,742	Face	L. M. A.	IV.	24	9	Face presentation	Flat pelvis; extended arms		"	Still-born	140.
"	7,813	Brow		I.	25	9	Brow presentation; deformed pelvis	Symphysiotomy (attempted forceps)		"	Living	140.
"	7,826	Vertex	R. O. P.		30	9	Prolapsed cord	Arms extended		"	"	Not heard.
"	7,891	Shoulder	L. Scap. P.	XIV.	30	9	Shoulder presentation	Prolapsed arm and cord		"	"	140.
"	7,895	"	R. Scap. A.	II.	24	9	" "			"	Still-born	140.
"	7,907	Vertex	R. O. A.	II.	20	9	Flat pelvis			"	Living	144.
"	7,981	"	R. O. P.	VI.	35	9	Position, impending asphyxia	Right leg and arm extended		"	"	Not heard.
"	7,985	"	R. O. A.	II.	30	9	Placenta prævia	Failure forceps; occipito-posterior position		"	"	160.
"	9,954	"	"	XIII.	30	9	"	Arms extended; arm fractured		"	"	160.
"	8,110	Shoulder	L. Scap. A.	III.	25	9	Shoulder presentation	" "		Died 2d day postp.; fever	Died in a few moments	Not heard.
"	8,150	"	R. Scap. A.	V.	23	9	" "	Prolapse of cord		Living	Living	138.
"	8,165	Vertex	R. O. A.	I.	23	9	Prolapsed cord	Prolapse of cord and left hand		"	"	140.
"	8,350	"	L. O. A.	III.	25	9	Justo-minor pelvis	Deformed pelvis		"	"	146.
"	8,274	Shoulder	R. Scap. A.	I.	33	9	Shoulder presentation; prolapsed cord	Prolapse of cord; extended arms		"	"	146.
"	8,634	Face	L. M. A.	VII.	30	9	Face presentation	Extended legs and arms		"	"	144.
"	8,684	Vertex	L. O. A.	II.	37	9	Flat pelvis; failure uterine force	Arms ext.; no progress; fractured humerus in child		"	Died 2 days postpartum	160
"	8,690	Shoulder	L. Scap. A.	VII.	20	9	Shoulder presentation	Prolapse of cord and left hand		"	Still-born	160.
"	8,710	Vertex	L. O. A.	VI.	38	9	Prolapsed cord	Twins; prolapsed arm		"	Living	120.
"	8,749	"	R. O. P.	VII.	35	9	Flat pelvis; uterine inertia	Fracture of arm		"	Still-born	150.
"	8,763	"	L. O. A.	IV.	35	9	Prolapsed cord	Failure of forceps to cause head to engage; arms extended; occipito-posterior position		"	Living	148.
"	8,785	"	"	X.	38	7½	Placenta prævia; profuse hæmorrhage			"	"	142.
"	8,850	Shoulder	R. Scap. A.	VI.	23	9	Shoulder presentation	Prematurity; right arm extended		"	Died 6 hours postpartum	Not heard.
"	8,859	"	L. Scap. A.	VI.	23	9	" "	Prolapsed cord and hand		"	Still-born	160.
"	8,889	Vertex	L. O. A.	III.	28	9				"	"	Not heard.
"	8,905	Shoulder	R. Scap. A.	IX.	36	9	Narrow conjugate; uterine inertia	Tumor obstructing superior strait		"	Died 3d day postpartum	146.
"	8,989	Vertex	L. O. A.	VII.	33	9	Placenta prævia; shoulder presentation	Extended arms; cord three times about neck		"	Living	144.
"	9,181	Shoulder	L. Scap. A.	III.	24	9	Prolapsed cord	Right arm extended		"	"	126
"	9,384	Vertex	L. O. A.	III.	24	9	Shoulder presentation	Prolapsed cord; right arm extended		"	Still-born	Not observed.
"	9,404	"	"	V.	32	9	Deformed pelvis; uterine inertia	Hydrocephalus; rupture of uterus		"	"	130.
"	9,426	Shoulder	R. Scap. A.	VI.		9	Prolapsed cord	Postpartum hæmorrhage		"	Living	Not observed.
"	9,461	"	"	IV.	32	9	Shoulder presentation	" "		"	"	130.
"	9,533	Vertex	L. O. A.	I.	24	9	Deformed pelvis	Prolapsed arm; prematurity		"	"	145.
"	9,537	"	"	X.	38	9	Placenta prævia	Prolapsed cord; hæmorrhage		"	Still-born	130.
"	9,737	Shoulder	L. Scap. A.	II.	28	9	Shoulder presentation	" "		"	"	125.
"	9,784	"	R. Scap. A.	X.	35	9	" "	Prolapsed cord and hand; twins		" fever	Living	Not observed.
"	9,917	Vertex	L. O. A.	V.	23	9	Small pelvis; failure to deliver by forceps	Right hand behind head; twins (1st, deliv. by midwife)		"	Still-born	Heard.
"	9,919	"	"	V.	30	9	" " "			"	Living	146.
"	9,950	Transv., ft., cord		I.	23		Feet and cord prolapsed	Arms extended; both clavicles fractured		"	"	150.
"	9,959	Shoulder		III.	25	9	Shoulder presentation	Breech in right iliac fossa, head in left; both arms ext.		"	"	140.
"	10,069	"		IV.	36	9	" "	Left arm extended; right leg extended		"	"	140.
"	10,047	Vertex	L. O. A.	II.	30	9	Deformed pelvis (flat)	Left arm displaced behind back		"	Still-born	140.
"	10,136	"	"	I.	25	9	" "	In labor three days		Died at Bellevue *	"	None.
								Prolapsed cord; in labor two days	Forceps failed; right arm extended	Living	"	138

* Died at Bellevue 22 days postpartum, or 14 days after discharge from this Hospital.

performed fourteen times; in seven delivery followed naturally, and in the other seven delivery was accomplished by means of some other operative procedure.

What has seemed to be the chief condition present has been recorded as the indication in the following cases in which podalic version was performed:

INDICATIONS.

	Cases.		Cases.
Shoulder presentation	82	Exhaustion of patient, arm prolapsed	1
Placenta prævia	13	Ruptured uterus	2
Prolapse of the cord	35	Brow presentation	2
Deformed pelvis	27	Weak pains, and spontaneous change from vertex to shoulder	1
Transverse presentation	3	Presentation of arm, foot, and cord	1
Hydrocephalus	2	Vertex, no advance	4
Attempted forceps (failure)	4	Hæmorrhage	2
Attempted forceps after cephalic version	1	Prolapsed arm (twins)	1
Attempted forceps in a face presentation	1	Failure induction labor (weak pains)	1
Face presentation, inconvertible.	1	Prolapsed hand and arm	3
Vertex, no indication recorded	1	Exhaustion, weak pains	3
Face, posterior position of chin	1	Face presentation, no progress	1
Collapse, attempted forceps	1		
Albuminuria, threatening symptoms	2		
Eclampsia	4	Total	200

Under the head of "Complications," the following conditions are tabulated. It will be noticed that many of the complications are identical with conditions recorded as indications in other cases.

COMPLICATIONS.

	Cases.		Cases.
Prolapse of the cord	30	Deformed pelvis	8
Extended arm or arms	29	Ruptured uterus	3
Prolapsed arm	30	Forceps to after-coming head	3
Hæmorrhage and shock	20	Pneumonia	3
Twins	15	Hand displaced behind head	2
Attempted forceps	9	Prolonged labor (more than 3 days)	2
Occiput posterior position	7	Patient alcoholic	2
Immaturity	6	Shoulder impacted (dry labor)	2
Leg or legs extended	5	Leg prolapsed	2
Previous cephalic version	5	Hydramnion	2
Symphysiotomy	6	Deep laceration of cervix	2
Fracture humerus	6	Extreme rigidity of ring of Bandl	1
Placenta prævia	12	Prolapsed arm and leg	1
Midwife cases	4		

Complications.—(*Continued.*)

	Cases.		Cases.
Phthisis	1	Induced labor	1
Face presentation	1	Rigid cervix (undilatable)	1
Head extended	1	Incision of cervix	1
Uræmia	1	Anencephalus	1
Craniotomy, after-coming head	1	Hydrocephalus	1
Child's skull fractured	1	Total	230
Albuminuria and threatened eclampsia	2	No complication other than the indication	45

More than three-quarters of all cases were complicated, 230 complications occurring in 162 deliveries, and but 45 cases that were not complicated. This has, of course, a very important bearing upon the mortality rate, not only for the mothers, but for the children.

There were fourteen maternal deaths, divided as follows:

	Cases.		Cases.
From rupture of the uterus	3	Eclampsia	1
Shock and hæmorrhage	7	Sepsis	2
Pneumonia	1	Total	14

Of the 222 children, 149 were born alive, 65 were still-born, and 8 died during the puerperium.

Cause of Death in Still-Born Children Delivered after Podalic Version.

Table No. I.

	Cases.		Cases.
Prolapsed cord	20	Placenta prævia and immaturity (one case of twins)	3
Shoulder presentation (uncomplicated)	6	Placenta prævia and extended arms	1
Shoulder presentation, arm displaced posteriorly	2	Eclampsia (one case of twins)	4
Shoulder presentation, extended arms	1	Attempted high forceps	2
Shoulder presentation, hæmorrh.	1	Forceps, after-coming head, and extended arms	1
Deformed pelvis	7	Ruptured uterus	1
Deformed pelvis and hæmorrhage	1	Hæmorrhage	1
Deformed pelvis and fractured skull	1	Hæmorrhage and prematurity	1
Deformed pelvis and craniotomy, after-coming head	1	After cephalic version	1
Deformed pelvis and ruptured uterus	1	Hydrocephalus	2
Placenta prævia	4	Anencephalus	1
		No cause assigned	2
		Total	65

In many of these cases the child was dead before operating. No fœtal heart could be heard in 85 instances, or in more cases than the total number of still births. The cause of still birth can be assigned to accidents in every instance, excepting two.

Cause of Death in Children Dying During the Puerperium, Delivered by Podalic Version.

There were seven, the circumstances of which are as follows :

One died six hours postpartum, a premature child, in a case of placenta prævia.

One died after a few moments, in a placenta prævia case.

" " 25 minutes postpartum, in a placenta prævia case.

" " 3 days " in a case of deformed pelvis.

" " 1 day " " " "

" " 5 days " " prolapsed cord.

" " 2 " " " face presentation.

" " 6 " " no cause assigned.

Among these cases, also, the fatal results can be ascribed to accidents in delivery, in all but one instance, and were not due to the operation itself.

Placenta prævia is a condition important enough to demand special consideration.

The cases which appear in this table, however, are included in a special article elsewhere in the report, so that the results need not be repeated.

Prolapse of the cord is a condition which complicated the delivery 64 times. There were undoubtedly other cases in the service of the Hospital, which do not appear among version operations.

The routine treatment in such cases is reposition where the conditions are favorable. When conditions are unfavorable, by reason of complications, or when attempts to replace the cord fail, version is usually done.

Although shoulder presentation or placenta prævia frequently occurred among these 64 cases, 42 children survived, 20 were still-born, and 2 died during the puerperium.

To tabulate the complications in the 42 cases of living children would involve useless repetition. A table of the complications in the 20 cases of still births has been made, with an idea of explaining the fatal results.

Still Births in Cases of Prolapsed Cord.

	Cases.
Complicated by shoulder presentation	5
" a deformed pelvis	4
" extended arms	3
" ruptured uterus	2
" depression child's skull	1
" forceps to after-coming head	1
No complications	4
Total	20

The death which occurred on the fifth day after delivery, in a case of prolapsed cord, could not be traced to any special cause.

Such a summary of cases in which version was performed develops nothing new in regard to the treatment.

The operation, its causes, and the results for the mother and child are submitted in the form of a statistical report. In the opinion of the writer it proves the fact that it is possible to obtain good results under unfavorable surroundings, when care is taken to observe antiseptic precautions in operating. Among all the cases, but one maternal death can be ascribed to sepsis. Two others were unavoidable, and had no bearing on the operation whatever; namely, the cases of pneumonia and eclampsia. The remainder were caused by shock, hæmorrhage, and ruptured uterus.

It is but fair to again direct attention to the fact that many of these cases did not come under the care of the Hospital until late. Every obstetrician can recall the desperate nature of cases sent to hospitals as a last resort, and neglected up to the time that they are admitted.

The mortality rate from all causes, in cases of version, was 6½ per cent.

I do not wish to be understood as advocating treatment of serious cases in the tenements rather than transferring them to a properly equipped hospital. Such a course would needlessly sacrifice many lives. On the other hand, when it is impossible to operate under favorable surroundings, good results may be expected under even the most unfavorable conditions, in a great majority of cases.

The results, whatever they may be, depend directly upon the ability to carry out antiseptic principles and apply them to obstetric surgery.

FRACTURES IN THE NEW BORN.

By Churchill Carmalt, M.D.

Among the histories of 10,233 deliveries in the Lying-in Hospital and Dispensary, delivered by 1,631 men (1,545 students, 86 staff—the staff, however, responsible for all fractures recorded), there are histories of 40 infants suffering from 42 fractures. Five craniotomies and embryotomies are included in that number. This is a ratio of one fracture to each 250 deliveries and to each six accoucheurs, a frequency much greater than ordinarily noted.

Of these injuries the writer has personally seen twenty-three, some of them not included in the statistics here presented, but in all the diagnosis rested upon the joint opinion of the attending surgeon, at least two members of the Hospital staff, and one or more students. Like all statistics, these are only approximately correct; as cases individually they may be useful. The preponderance, mentioned by most writers, of fractured humeri is apparent in the following table:

Fractures of the skull	Living children	5
" " "	Dead "	2
Craniotomies and embryotomies	" "	5
Fractures of the jaw	" child	1
" " clavicle	Living children	2
" " humerus	" "	18
" " "	Dead "	6
" " forearm, scapula, ribs, sternum, pelvis		0
" " femur	Living children	1

Multiple Fractures :

Fractures of both clavicles	Living	1
Fractures of skull and humerus	"	1

The relation of fractures to operative procedures is shown in the following table. In cases of abortion no position is recorded, so that these statistics in regard to the fœtus refer only to those that have reached at least seven months' development. As the number of still births in any hos-

pital statistics diminishes, there will probably be an increase in the fœtal damage or the number of induced labors.

	Number of Cases.	Still Births.	Macerated Fœtus.	Premature Births.	Abortions.	Deaths within Six Days.	Death Due to Manual Interference.	Fractures of Skull.	Fractures of Humerus.	Other Fractures.
Totals	10,233	359	110	218	417	215	?	13	24	5
Low forceps	240	29	2	1	0		?	0	1	0
High forceps	141	16	0	0	0		?	4	0	0
Attempted high forceps and version	13	7	0	0	0	1	5	0	1	2
Embryotomy and cranioclasm	5	5	1	1	0	0	3	(5)	0	(1)
Podalic version	148	35	11	3	0	9	14	2	11	1
Breech presentation	341	59	27	7	0	31	?	2	9	2
Shoulder presentation	91	23	1		0	2	?	(1)	(5)	(1)
Plural births	161	35	7	3	0	35	2	(1)	(1)	0
Vertex	8,495	211	5		0	126	?	(4)	(10)	(2)

All of these fractures were due to manual interference in delivery under conditions that would have sacrificed the child and perhaps the mother without such interference. Nevertheless, operative ignorance on the part of the obstetrician has been an etiological factor. Caused by ignorance, I would class those fractures of the skull due to pressure through the abdominal wall in efforts to express the after-coming head, a large number of the fractures of the humerus in breech extractions, and multiple fractures in cases where symphysiotomy or Cæsarean section should have been chosen, instead of some more usual obstetric procedure violently performed. There were 34 fractures among 506 breech extractions and presentations, against 8 fractures among all other modes of delivery.

Fractures in the new born differ from other fractures only in their etiology, rapid repair, perhaps the infrequency of complications, and in the application of apparatus to such small bodies.

Definition (*Dr. Stimson*).

"A fracture is a solution of continuity in the more solid connective tissues, bone and cartilage, such occurring 'spontaneously' in healthy tissues, or 'pathologically' in diseased tissues; not a very technical, but convenient, statement."

Classification (*Stimson*).

Incomplete (common in infants):

a. Fissured (leading to periosteal infection).

b. Green stick (deformity of a long bone with fissure).

c. Depression (no macroscopic solution of continuity).

d. Separation of splinter or apophysis.

Complete, divided as to:

a. Direction of line of fracture (usually transverse in infants).

b. Seat of fracture anatomically (epiphyses, shaft, etc.).

c. Relation to joints (intraarticular are not common).

d. Mode of production (direct violence, etc.).

e. Number of fractures (multiple are common in real intrauterine fractures).

Compound:

a. With ordinary wound of skin.

b. Gunshot (all so far reported in new-born, dead).

Displacement may be transverse or lateral, angular, rotary, by overriding, impaction, crushing, or direct longitudinal separation.

Etiology.

Etiology will be studied more particularly under the head of fractures of the individual bones. Usually these fractures are the results of manual or instrumental interference, undertaken to change the position of a displaced limb or head of a fœtus in utero, to supplement the insufficient expulsive power of the uterus, or to hasten delivery in conditions menacing the life of the mother or the child.

Whether in instrumental interference or by uterine force, strain, superior to the resistance of fœtal bone, exerted from without, through a comparatively short period of time and with varying leverage, is the cause of all these fractures.

Fractures by violence of uterine force alone, when a limb is caught between the hard parts of the mother and the body of the child, are very rare; but three cases are cited by Hamilton, and the mechanism is carefully explained by Reynolds. Fractures of the skull pushed by uterine force alone through anomalous pelves are reported by Rosinski.

The resistance or elasticity of fœtal bone studied under the dissimilar conditions of life, death, time of pressure, point of pressure, differing kinds of force, and long and short leverage, is hard to estimate. It is partially decided for adult bones to be about that of cast-iron. In experiments on the dead fœtus, now undertaken at this Hospital, these elements shall be studied for a future report. A force of about twenty pounds applied for one minute on the humerus of a still-born male child, with a leverage of one and one-half inches on each side of a fixed point, fractured the humerus transversely. (Experiment of writer, December 2, 1896.)

Uterine force is estimated at from six to three hundred pounds. In difficult labors, as in nearly all of those deliveries in which fractures occur,

the force exerted by the uterus on a circle four and one-half inches in diameter—the dilated os uteri—is at least sixty pounds. If deflected, by the pressure of the accoucheur's finger or instrument, against a point on a limb or a flat bone fixed in the uterus or pelvis, such a force is more than sufficient to fracture that bone. Any manipulation of insignificant force itself, permitting point of support as a fulcrum for lever made of fœtal bone, may cause a breaking pressure to be exerted against the arms of such lever. Experiments as to uterine force are vitiated for the most part by the difficulty in estimating the resistance to be overcome. Haughton's purely theoretical calculations are immensely too large, as shown by Matthews Duncan, whose estimate of sixty pounds has not been disproved. Proofs of the truth of these estimates, it is hoped, will be ready for the next Report.

Predisposing Causes of Fracture.

Weight of Child.—As shown by this series, the larger children—all but one over 6¾ pounds at birth—are much more liable to fracture than their leaner fellows.

Sex of Child.—As a corollary to the above, the weight of males averages somewhat greater than that of their sisters, and on that account males are more liable to fractures. Also, the children of multiparæ are larger than those of primiparæ, and, therefore, more liable to injury.

Early ossification of bones, particularly the skull, predisposes to fractures. The cause of this condition is unknown, unless chronic periostitis may lead to it. Rare diseases, myositis ossificans multiplex progressiva, might cause fractures.

Syphilis renders the nutrition of bones poor, but the children are usually small and their delivery easy. If syphilis causes hydrocephalus, that, of course, might demand craniotomy, and syphilitic osseous dystrophy or osteopsathyrosis may cause a separation of epiphyses.

Rachitis (rare in the new born) may predispose to fractures. It is claimed to be the most common cause of real intrauterine fracture. Myxœdema or cachexia strumipriva in the mother (Kocher) renders the child liable to rachitis, and so possibly more liable to fracture. As with syphilis, these children are usually poorly nourished, and their delivery is accomplished with little difficulty. Intrauterine cretinism, associated as it is with rachitic malnutrition and malformed skulls, would probably predispose to fracture. Haig asserts that even an inherited tendency to the uric acid diathesis would render bones brittle.

Position of the fœtus in utero, breech presentation, transverse positions, and any condition requiring podalic version, with its consecutive breech extraction, seems a special menace to the integrity of the child's limbs and vertebræ (34 cases among 506 such positions). Pelvic deformities and uterine inertia, in conditions necessitating the use of forceps, are more liable to fracture the skull, thorax, and pelvic girdle.

The chemistry of fœtal bone and the pathology of such conditions as early union of suture lines, early ossification, the influence of the hypo-

physis cerebri, the thymus and thyroid glands on bone nutrition, are at present too obscurely understood to indicate anything save possible defects in present pathological teachings.

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Repair.

Malgaigne (1840) in his clinical lectures said that "bone for bone and fracture for fracture, repair in children requires only half so much time as it does in adults." All subsequent writers agree with him, as do the histories of cases here recorded. "Breaks of lower limbs take more days in healing than those of upper limbs; of the latter more than of the skull; of midshaft more than of epiphysis; of bone with permanent displacement or mobility more than of fragments in accurate apposition." (Stimson, p. 113.)

The reasons for such active repair are the greater proportionate blood supply to infant bones, the greater thickness of the osteogenetic layer (twice that of adult bone, according to Cohnheim) of the infant's periosteum and the weaker musculature of the fœtus, causing little spasm and small tendency to displacement.

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Signs.

Objective:

Deformity—angular, longitudinal.
Abnormal mobility.
Crepitus (not easily made out in infants).
Spasm (not common), muscular twitching.
Loss of function; pseudo-paralysis.

Subjective:

Tenderness.
"Night cry" (very common).

After repair has taken place, the limb may be shrunken, muscles wasted and feeble, skin dry, with tendency to congestion and desquamation, stiffness in neighboring joints (adhesions ?), callus, deformity, paralysis. These, however, disappear so rapidly in infancy that at the end of two or three months even a marked deformity may entirely disappear, as in a fracture of the skull, in a case cited below.

In diagnosis from malformations, defects, and paralysis, Röntgen photography may prove a great help, although the Röntgen photographs presented on pages 297 and 303 are not very satisfactory. More familiarity with the fluoroscope will probably obviate this defect.

Treatment.

Of recent years immobilization in some retentive apparatus has been the almost universal practice in treatment of fractures. It is accomplished with considerable difficulties in children, where points of fixation are few, pressure irritates the skin, and the dressings are continually wet from urine or careless bathing. These appliances are made from plaster of paris (gypsum), silicate of soda, wrapping-paper in layers moistened with glue, heavy cardboard fastened with adhesive plaster, preparations which become pliable on the application of heat or moisture, celluloid in acetone (lately much lauded). The last two are not always within easy reach, and the celluloid is inflammable.

It appears to be satisfactorily established through the writings of Lucas-Championnière, 1889, in France; Landerer, 1891, in Vienna; and Kendal Franks, 1891, in Dublin, that massage as practised in Egypt, Arabia, and India for centuries (Slatin Pasha) "promotes comfort, and at least expedites restoration of function when there is little displacement of fragments, when the skin is uninjured, and when the bone is not too thickly covered with muscles, as in the neighborhood of joints." (Stimson in Sajous's Annual, 1895.) This would indicate that fixation apparatus may be removed daily and the child cleansed without the resulting harm often claimed. Because many untreated cases (probably the majority) recover with perfect function and without deformity, such removal of dressing may be advised under proper restrictions. Massage increases the amount of callus, but certainly maintains the nutrition of muscles.

Complications.

Permanent deformity (common only in frontal depressions apparently).

Exuberant and painful callus (due to malposition of fragments, interposition of soft parts, syphilis, scurvy, rachitis (?), when the embryonal bone stage persists) is a common complication, but disappears rapidly without treatment.

Pseudarthrosis, very rare in these fractures. (Bruns.)

Inclusion of nerves in callus and paralysis due to injury of nerves are reported by Dr. Weir Mitchell (Injury of Nerves, p. 104).

Sarcoma in callus is reported by Bruns (only case reported).

Stiffness of joints and limbs and atrophy in segments above and below the fracture, noted by Gosselin, are certainly very uncommon in the fractures of infants.

Hæmorrhage, exceedingly common on account of infant's thin arterial walls, the special danger of fractures of the skull.

Fat embolism (no case reported).

Œdema and thrombosis seem to be moderately common, but disappear rapidly.

Diminished growth from so-called epiphyseal injury is more probably due to chronic osteitis or osteomyelitis, with early ossification.

Acute epiphysitis, Dr. C. B. Poore maintains, is often an infection of unrecognized fracture from a suppurating umbilicus, infected pin-prick, etc.

Gangrene, especially common in the young, so that pressure from bandages must be carefully watched. (Stimson, Fractures, p. 141.)

Tuberculosis of bone in the young seldom, if ever, follows a fracture, as the injury is productive of such active cell prolification that this very activity will hold in abeyance the pathogenic action of tubercle bacilli. (Volkman, quoted by Senn.)

Nervous delirium, quite like the milder types of delirium tremens in adults, must be moderately common, as the writer has seen two cases in children, following fracture.

The literature of complications is very meagre, and in the discussion following Dr. Lovett's paper in Boston in 1893, most of the men denied having seen any complications.

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Fractures of the Skull.

The photograph and tracing (Figs. 1 and 2) show the conditions existing in the child (C. N. 26); age two years. Now, after five years, the conditions remain unchanged. The drawings (Figs. 3 and 4) indicate more fully than the history, the autopsy of C. N. 255 (indoor history) and C. N. 378 (indoor history).

The lettered cases are noted for peculiar features. The cases from the indoor histories and later outdoor cases are preliminary to the next report. None of these cases are included in the statistics.

Locality of the Fractures.

Parietal depression among the new born, Matthews Duncan and Rosinski say, is more common than all other fractures of the skull. In the seventeen infant skull fractures seen by the writer (two not in this series) eleven had parietal depression. As the head descends with the long diameter transverse to the pelvis, the parietal bones are exposed to pressure from the short conjugate, and, low in the pelvis, to pressure from forceps blades.

Frontal depression, Jennings says, persists if untreated. This record confirms this assertion, one case thirty years old still showing marked depression, one after five years, and one after two, while no purely frontal depression corrected itself as did the parietal, occipital, and temporal depressions. The frontal arch, with its buttressed base, is less subject to change of shape, after depression, from intracranial or extracranial pressure than the parietal or occipital regions. On account of the disfigure-

Number.	Lying-in Hospital Record.	Previous Children.	Month of Gest.	Para.	Presentation.	True Conjugate.	Dystocia.	Operation.	Difficulties of Operation.	Result to Mother.	Sex of Child.	Length of Child.	Weight of Child in pounds	Head Measurements of Child.	Cause of Fracture.	Position of Fracture.	Symptoms.	Immediate Treatment.	Immediate Result to Child.	Condition of Bones.	Deformity.	Final Result.	Remarks.
96	Abornative with instruments; 3 dead.	10	V.	L. O. A.	Ext. conjugate, 22 cm.	Spondylolisthesis.	High forceps.....	Great force used in traction; forceps broken.	Recovery	Male...	24 in.	11¼		Pressure of brow against promontory.	In mid frontal region, 1 by 1 inch.	Vomiting first few days; facial paralysis from forceps.	None.	Good...	Normal.....	Depression remains now, 5 years later.	Child bright; no paralysis.	Two succeeding children killed in delivery.
106		6	I.	(Twins) Vertex.	4½ inches.	Placenta previa	" "			"	" ..	13½ "	2		Pressure of hand upon soft bones of head.	Parietals	Deformity		Death...	Soft; premature; macerated.	Yes		
1,491	5 alive	10	VI.	L. Semp. A.		Placenta previa; displacement of child.	Podalic version; breech extraction.	Arms locked behind head.	Sepsis; recovery.	Female	21 "	8½	Bitemporal, 3 inches	By press. thro. abdomen upon head against prom.; by force in extract. 1st arm.	Fronto-parietal region; shaft of right humerus.	None from skull save depression.	None for skull.	Good...	Normal...	Depression remained 1 year later; nrm O. K.	Child bright; no cerebral symptoms.	
1,131	5 alive	10	IX.	R. S. P. L. S. P.		Twins locked (?)	High forceps	First child caught against second.	Recovery	Male...	20 "	8½		Pressure of one child against twin.	Left parietal, 2 by 2 inches, but not deep.	No symptoms save depression noted.	None.....	" ...	?	No	Depression disappeared in 10 days.	
1,209	Previous labors "easy."	10	V.	L. S. P.		Jutting promontory.	Breech extraction	Arms and legs extended.		" ..	22 "	9	Biparietal, 4½ inches; bitemporal, 3¾ inches.	Pressure through abdomen against head of child and promontory.	2 in. below sagittal suture, by upper anterior border of temporal bone.	Delayed respiration; depression on fifth day.	Fracture not noted on account of caput.	" ...	Normal.....	"	Depression disappeared in 1 month.	
1,653		10	I.	L. O. A.	Ext. conjugate, 7½ in.	Jutting promontory; albuminuria.	High forceps.....	Small pelvis; operation 1 hr. 10 min.	Death; anæmia, shock.	" ..	20 "	10½	Occipito-mental, 6; trachelo bregmatic, 4½; biparietal, 3⅜; bimastoid, 2½; bitemporal, 3⅜; bimolar, 3⅜ in.	Pressure of forceps blade and promontory.	Right temporal region (?)..	Delayed respiration 10 min.; cut in temporal region just above ear down to bone.	Iodoform dressing removed; wound soiled with feces.	?	?	?	Wound infected on 5th day.	10th day father took baby out of reach of hospital; history negative.	
[illegible]	1 abortion.	10	II.	R. O. P.	4 inches.	Small pelvis; displacement child.	High forceps.....	Great force used.	Recovery slow.	Female	19 "	7½		Fœtal bones overlapped too far.	Rupture of coronal suture.	Delayed respiration; cephalhæmatoma; pulsating tumors both sides median line; facial paralysis.	Cold to head	" ...	"	"	Tumors disappeared on 30th day; no paralysis.	By pressure on the tumors, convulsions could be brought on when fluid disappeared.
8,881	? alive	10	III.	L. O. A.	3 "	Exostosis on posterior surface of symphysis.	Podalic version; breech extraction.	Narrow pelvis....	Recovery	" ..	22 "	7½	Between depressions, 3 inches; behind depression, 3¾ inches.	Pressure in traction of head between promontory and exostosis.	Left parietal anteriorly; right side between parietal & temporal depression	Breathed only a few times	Artificial respiration.	Death.	"	Yes		Autopsy.
a	Indoor history, 111.	10	I.	L. O. A.	4 "	Deformed pelvis	Symphysiotomy; high forceps.	Tetanic uterus; rigid vagina.	Death; sepsis.	Male...	19 "	8	Biparietal, 4 inches; bitemporal, 3¾ inches.	Pressure against promontory by uterine force noted before operation.	Left parietal.....	None	None	Good...	" ...	No	Depression disappeared in a few days; discharged 16th day.	
b	Indoor history, 256.	10	IV.	L. S. A.	4½ "		Accouchement forcé; breech extraction.	None (?).....	Recovery	" ..	19 "	7½		Expression through abdomen of head against promontory.	" "	Breathed only a few times.	Artificial respiration.	Death.	"	Yes		Autopsy; Fig. 3, p. 290.
c	Indoor history, 328.	10	I.	R. O. A.	3½ "	Jutting promontory; small pelvis	High forceps	None (?).....		Female	19 "	7½	Bitemporal, 3 inches.	Outgoing of head through narrow conjugate.	Across upper part both parietal bones.	Delayed respiration; facial paralysis; convulsions.	" "	Death, 24 day.	Bones thin, very friable; sagittal suture ossified.	No		" Fig. 4, p. 290.
d	In private, Dr. J. W. M., Aug. 1887.	10	I.	R. O. P.		Jutting promontory.	Ped. version; accouchem. forcé; high forceps unsuccessful.	Small pelvis and vagina; arms extended.	Recovery slow; perineum torn.	Male...	23 "	10½		Expression of head through abdomen against promontory; extraction arm.	Parietal region; right side, 2 by 1 by 2 in.; shaft right humerus; upper and middle ⅓.	Paralysis flexor muscles left arm, apparently due to twist of neck.	None for skull; splints for humerus.	Good...	Normal	" ...	Depression disappeared; humerus O. K.	1 year later no depression, no cerebral symptoms; right humerus same as left.
e	D. R.	9(?)	I.				Forceps		Good.....	" ..	Large		Apparently pressure of forceps blade.	Right fronto-parietal region, 1 by 1 by ½ inch.			" ...	"	Yes		Now depression remains, 30 years since delivery; mum remarkably bright physicist.
f	Obs. hosp., Dr. Stimson, N. Y. H.		II.				"		Good.....	" ..			Apparently pressure of point of blade.	Right frontal region over eye, 1 by 1 inch.	Convulsions (?).....	Cupping (?).....	" ...	"	"	At 2 years old child bright; walked and talked; no cerebral symptoms.	Operation to relieve depression and deformity; found cyst beneath, on opening which child went into collapse and died.
g	11,851	2 alive with instr.; 1 abortion; 1 dead.	10	V.	R. O. P.	3½ inches.	Oblique pelvis; jutting prom.; placenta prævia; displaced child	Podalic version...	Arms and leg extended; great force.	Recovery	" ..	20 "	9		Pressure through abdomen against head.	Left parietal	Delayed respiration 10 min.; paralysis left arm; swelling and ecchymosis right leg; temperature, 105°.	Artificial respiration	Good...	Normal	"	Internal depression less in 10 days.	
														FRACTURE OF JAW.									
	9,050		10	I.	L. S. A.		Small pelvis; malposition fœtus.	Breech extraction; fingers in mouth.	Delay in delivery head.	Good.....	Male...	20 in.	8		Traction on jaw in delivery of head.	Angle of mandible, both sides; compound.	Bleeding from mouth; crepitus; deformity; abnormal mobility.		Death; still birth.	Normal	Yes		
														FRACTURES OF CLAVICLE.									
	7,691	1 abortion.	9	II.	R. S. A.	Ext. conjugate, 7 in.	Malposition fœtus.	Breech extraction	Arms extended; leg extended.	Good.....	Male...	16 in.	7		Twisting of shoulder in extraction of 2d arm.	Right clavicle; outer ⅓.	Crepitus; deformity; delayed respiration.	Sayre's strapping.	Good...	Normal	Yes; callus	Arm weak; Erb's paralysis.	23d day good union; callus large.
	9,913	1 alive and well.	10	V.	L. O. A.	4½ inches.	Small pelvis; large child; uterine tetanus.	High forceps unsuccessful; podal. version; breech extraction.	Arms extended; uterine tetanus.	"	" ...	24½ "	9		Twisting of shoulders in extraction of extended arms	Both clavicles; middle ⅓	Crepitus; deformity	None	" ...	"	"		No further report.
c	Indoor history, 205.		10	I.			See under Fractures of Tibia and Fibula.								Pressure upon clavicle in extracting head with fingers over shoulder.	Clavicle; inner ⅓.	" " ...		Death	"			Autopsy.
														FRACTURE OF FEMUR.									
	2,409	9 alive	10	VIII.	R. Semp. A.		Malposition fœtus; tetanic contr. uterus.	Podalic version; breech extraction.	Tetanic contraction of uterus.	Good.....	Female	19 in.	6½	Small	Traction upon foot, with leg across promontory of sacrum.	Left leg; upper ⅓; ecchymosis on left arm.	Crepitus; deformity	Splints and temp. dressing; long splint from sacrum to heel and perineum to heel.	Good...	Normal	No (?)	18 days, large callus; poor union.	28th, union solid; function good; shortening (?).
														FRACTURES OF TIBIA AND FIBULA.									
f	Indoor history, 205.		10	I.	R. O. P.	3½ inches.	Jutting promontory; malposition fœtus.	High forceps unsuccessful; podal. vers; breech extr.; fillet on feet.	Arms, afterwards funis, pus; arms slipped by head; condition of patient poor.	Recovery very slow; septicæmia.	Female	20 in.	7½		Feet hyperextended; great force used.	Left tibia from lower epiphyses; right tibia and fibula from both epiphyses.	Extravasation of blood at ankle.	None....	Death due to cerebral congcs.	Normal			Autopsy.

Fig. 1.—C. N. 26.

Fig. 2.—C. N. 26. Tracing Taken at Level Marked (1) in Fig. 1.

Fig. 3.—C. N. 255, Indoor History.

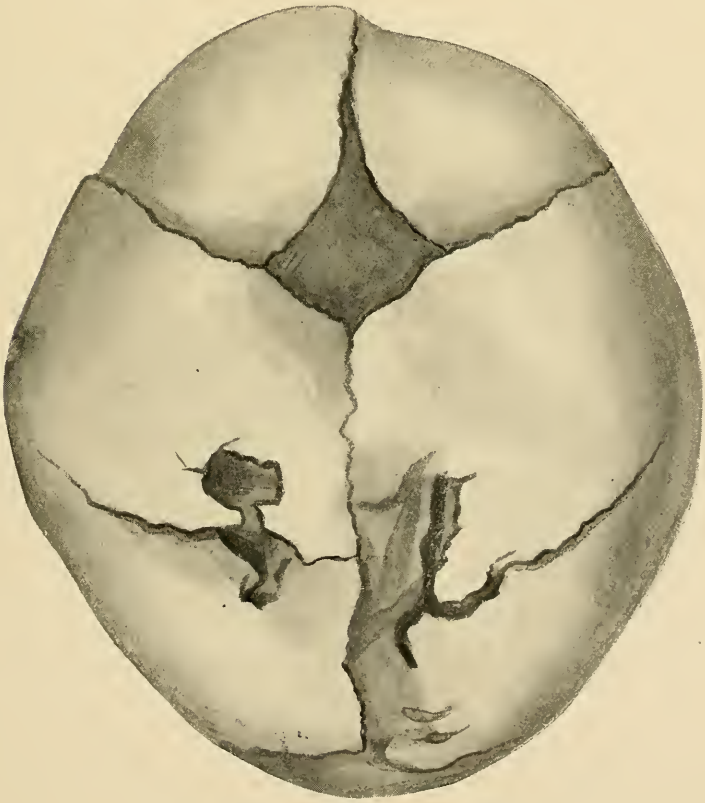

Fig. 4.—C. N. 378, Indoor History.

ment, these frontal depressions are less often overlooked than the others. They are usually caused by pressure of forceps applied in the pelvic curve of the mother to the head of the fœtus when above the brim of the pelvis. Even in the hands of good operators this accident may occur. The cephalic application of high forceps, if otherwise safe, would avoid it.

Occipital depressions occur in the same way as do frontal, from pressure of "high forceps operations." Owing to the proximity of the medulla, these fractures would more surely cause death than any of the other forms. If the child lives, the depression usually corrects itself.

Whether the base of the skull in a child living after delivery is ever fractured is still a mooted question. Cases of facial paralysis are usually due to pressure of the forceps blade on the branches of the facial (seventh) nerve where those branches cross the mandible. Such cases recover in a short time. There are, however, one or two cases reported (Jolly) of permanent unilateral facial paralysis, infantile in origin, accompanied by unilateral deafness on the same side, also permanent, an occurrence strongly suggestive of fracture through the temporal bone.

Rupture of a suture line, as in C. N. 5,854, of course has the same dangers to the child as a fracture of the skull, with all the additional danger of meningocele.

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Prognosis.

Rosinski reports 44 cases, with 16 recoveries; Shroeder, 65 cases, with 33 recoveries (22 born dead, and 10 dying within a few days). Among the 17 cases seen by the writer, there are 10 recoveries.

That the depression is not always injurious, witness the now thirty-years' old, deep, frontal depression of D. E., an instructor in a New York college, and C. N. 26, at five years old, a very bright child. The new-born cortical brain cells are not developed (Edinger, His, etc.) save in the motor area, therefore the delicacy, noted by Jacobi, of the blood-vessels in childhood is not so great a danger as among similar injuries to adults. In giving a prognosis, one must be guided by the locality of the fracture, the accompaniment of injuries to the skin, the depth and area of the depression, the time taken in delivery, the time needed to resuscitate, the symptoms present after delivery or developing later. The after history of these cases is so often lost that an accurate study of their course is only made by the collected observations of different men, not always agreeing as to signs noted.

Complications.

All the dangers of fracture of the skull depend upon the complications, generally hæmorrhage, as the depression itself is usually not sufficient to

impinge dangerously upon cranial contents. If the fracture occurs from the use of instruments, the hæmorrhage is usually outside the dura mater, is slight in extent, and of little consequence; if, however, there is much overlapping of the cranial bones, or a very deep depression, there may be a large-sized hæmatoma in the cortical substance sufficient to cause death. Such a hæmatoma, beneath frontal depressions, indenting upon no vital centres, may, according to Dr. M. Allen Starr, remain as a cyst. (See case from Records of New York Hospital, lettered "f.") Operations upon such depressions and cysts are very dangerous, from change in intracranial pressure on removing the cyst fluid; an indication, therefore, for early operation, if any is to be undertaken.

The fractures of the skull due to breech deliveries and podalic version are usually accompanied by much cerebral congestion, and, therefore, often by hæmorrhage. The spastic paraplegias, idiocy, microcephalus, epilepsy, cerebral palsies, and insanity, as the result of difficult deliveries, and due to cerebral injuries, are noted in only one case of the 10,233 here considered. A child (C. N. 3,394) of healthy parents had an arm fractured in delivery, but no cerebral injury was noted at birth. One year later this child is a microcephalic idiot.

Infection from scalp wound and compound skull fractures, of course, predispose to meningitis, encephalitis, epiphysitis, septicæmia, or pyæmia.

Etiology.

A jutting promontory, or exostosis jutting from the pelvic wall, with breech extraction, seems to be the cause of skull fractures more common than anything, unless it be the perforator.

Pressure through the abdominal wall upon the after-coming head, in difficult breech extractions, seems the next most common cause; even more frequent than the hasty or injudicious pulling upon forceps applied at the superior strait before moulding has time to take place. These and the forcible approximation of the forceps blades (an uncommon cause, owing to the wide cephalic curve of an ordinary instrument) of course can be averted.

Pressure of the head against a displaced fœtal limb can only occur in much deformed pelves—a fracture from such cause is reported; also a case where a skull was fractured against a jutting promontory by uterine force alone (Tucker). Hamilton mentions such a case. Matthews Duncan describes a depression made by pressure of the accoucheur's finger in attempting to produce rotation. In precipitate labors infant skull fractures are reported from the fall of the child against the floor or the edge of the vessel over which the mother was standing. In an effort to resuscitate the child by Schultze's method, the writer has seen a child slip from the operator's hands, and in the fall sustain a fracture of the skull. Löwen and Joullin have demonstrated that a compressing force of 100 pounds applied for two or three minutes continuously will fracture the skull of a normal fœtus.

Symptoms.

The deformities of the skull are apparent at delivery if hæmatomata do not conceal them. Crepitation and abnormal mobility cannot be made out. Muscular twitchings or convulsions starting unilaterally, unilateral paralysis, blindness or deafness, coma, subnormal temperature, delayed respiration, irritability, sleeplessness, sudden death—all are indications of cerebral hæmorrhage, which may or may not be accompanied by fractures.

Diagnosis.

From cephalhæmatomata, either early, when the depression may not be noticed, or late, when the edge of the organized clot may be mistaken for depression. From overlapping of cranial bones, particularly abnormal or "Wormian" bones.

Treatment.

Dr. Irving W. Smith, Dr. McKennan, Dr. Jennings, each elevated such depressions as we have noted, with recoveries in all the cases. If the fracture is compound (unfortunately the forceps often make it), or if the depression causes symptoms of compression—subnormal temperature, coma, respiratory delay—as in Dr. McKennan's case, there would be no question as to the propriety of elevating the depressed bone. Frontal depressions are commonly permanent, therefore this would particularly apply in their case. Parietal and occipital depressions usually correct themselves. However, in a deep parietal depression recently seen by the writer, after breech delivery through a narrow conjugate, when respiration could not be excited after twenty minutes, and the heart was becoming slow, it seemed as if, had elevation been practised, the child might have been made to breathe.

Jennings summarizes active treatment thus: first, the use of cups (among older writers condemned for the intracranial hæmorrhages the cups apparently caused; unsuccessful, also, in a trial of their use seen by the writer); second, elevation, itself not a dangerous proceeding, save for possible infection. Jennings advises replacement of any pieces removed. He urges immediate action if symptoms are present, even if the operation has to be done with a boiled pocket-knife. Later interference he suggests if the depression be more marked at the end of the second week. Because loss in weight will of itself increase any depression in an infant's skull, and an organized clot (Dr. M. Allen Starr) might have already assumed the character of a cyst, such interference should be undertaken at birth or within a day or two.

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Fig. 5.—C. N. 11,016. A Pin in Bandage, and Thumb of Nurse Holding Limb while Exposed to Röntgen Rays are Shown.

Separation of Epiphysis.

The radiograph (Fig. 5) here given was taken of a case (C. N. 11,016) to be fully reported in next series. It is supposed to be an epiphyseal separation. The epiphysis is apparently so cartilaginous that Röntgen photography penetrates it the same as through other soft parts.

Gurlt, 1862, reports three cases of separation of epiphysis at birth, diagnosis verified at autopsy; one by traction upon feet, two by traction upon arm or axilla. Hamilton mentions a case, while Bruns, in a series of eighty-seven, mentions ten that occurred at birth. According to Gurlt, it is difficult to separate an epiphysis by direct traction, but very easy on forced hyperextension or hyperflexion of joints, more particularly the ankle, knee, elbow, and shoulder. C. N. 225 (indoor history) here recorded, verified at autopsy, showed separation of the lower epiphyses of both tibiæ, due to the use of a fillet around the ankles, the feet hyperextended in a difficult version.

If the child lives, early ossification of such separated epiphysis may take place and growth of that bone cease. The limb will then be shortened. Such a case is said to be the arm of the present Emperor of Germany. Arrest of growth from this cause must be rare, as stunted growth may be induced by fracture of the shaft when chronic inflammation of the bone has followed. Bruns has pointed out that the line of separation is more apt to be through the partially ossified portion of the epiphysis (the most brittle), and the chondrogenetic, or growing portion, to remain uninjured.

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Fracture of the Jaw.

Winckel alludes (citing a case of his own) to this danger in the old Smellie-Veit method of delivery with finger in the mouth of the after coming head of the fœtus, as in the case here reported. Dr. A. B. Davis, of this Hospital, in two breech cases where the children were known to be dead, found it impossible by this method to fracture the mandible, and the writer made the same observation in a third case. Parvin says a force of fifty pounds, direct traction, will break the jaw. Dr. Lusk speaks of having fractured a jaw in an effort to convert a brow into a face presentation.

Heath points out that most of these cases are fortunately still-born, and escape deformities in later life. A case at St. Mary's Free Hospital for Children, operated upon by Dr. Poore, the writer assisting, December, 1895, illustrates the possibilities. A boy, eleven years old, with atrophy of the mandible, ankylosis of the mandibular joint, unilateral bony coalescence of condyle and zygoma, existing since infancy, and fed by suction through gap between teeth where maxillary overlapped mandibular incisors; with no scars, no trouble with teeth, no appearance of tubercular infection. The parents were dead, and the history obscure. The probability seemed that a breech delivery had been completed by Smellie-Veit method, and fractures (perhaps compound, with periostitis, causing diminished growth of the mandible) had taken place. Excision gave him good movement of the poorly developed jaw he had left. Paralysis of the inferior dental branch of the fifth nerve might be a complication, as might atrophy of the jaw and unequal eruption of the teeth, or the occurrence of dentigerous cysts.

Such a fracture could be held in position by a starch bandage around the head or with a dental plate, and the child fed by gavage through the nose.

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Heath: Injuries and Diseases of the Jaws, London, 1884.

Winckel: (Edgar's Translation) Text-Book of Obstetrics, Philadelphia, 1890, p. 689.

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Fractures of the Vertebræ.

These cases, save in one instance, have not been included in the list of fractures, as decapitation divides so much beside bone. In C. N. 939, premature twins had both heads pulled off at delivery, and the heads afterward extracted with difficulty. C. N. 7,018 was a case of decapitation for an impacted shoulder position. In C. N. 8,743 the head was pulled off by too zealous traction upon an impacted breech.

Several cases have been reported due to Smellie-Veit mode of delivering the after-coming head when the body of the child has been bent backward

over the symphysis of the mother to save a perineum. Because the anterior spinal ligament, however, is weaker than other ligaments, it is more apt to give way than the bone. The awkward use of Schultz's method of resuscitation might fracture vertebræ, although no case has been reported.

If the child survived, fractures of the atlas might cause hypoglossal paralysis. (Erb.)

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Montgomery: Observations on Obstetrics.
Erb: In Ziemsen, 1876, vol. xi., p. 254.

Fracture of the Ribs.

No case in this series.

One fracture reported by Gebhard, where a rib penetrated the lung after Schultz's method of resuscitation had been tried. Death of the child resulted from hæmatothorax. Whether the method of resuscitation or the delivery caused the fractures is not stated.

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Fracture of Sternum.

No case in this series. Rauber has shown that in children the sternum may be forced back to the spinal column without fracture.

Andrée: J. f. Geburtsh., Frankfort a Main, 1828, viii., 101–107.
Tillmanns: quoted above.

Fractures of the Clavicle.

These fractures probably occur much more often than is generally stated, because the injury causes an infant very little inconvenience, and more cases of Erb's paralysis than of fractured clavicles are reported.

Etiology.

In the Smellie-Veit method of delivering the after-coming head, or any method of breech extraction, where two fingers are hooked over the shoulders as point of traction, not only is there a possibility of tearing away the cervical nerves from the roots, but of bending the clavicle against the upper or outer cord of the brachial plexus, and even of fracturing the clavicle, as in the cases here recorded. Cases are reported due to Schultz's method of resuscitation. The force is one of torsion and bending, a combination requiring the least power necessary to accomplish a fracture. Winckel mentions a case due to the arrest of a shoulder behind

the symphysis after a forceps delivery of a vertex. A similar occurrence, but due to uterine force alone, when in a vertex presentation the shoulder caught behind the symphysis, has been related to the writer by Dr. S. W. Lambert.

Complications.

Erb's or brachial paralysis may coexist. It is usually not due to the fracture, but to the same force which produced fracture. Rupture of the lung by the sharp end of a fragment is recorded by Schultz himself, in describing his mode of artificial resuscitation. Heyderich mentions a similar accident. Puncture of the brachial cord is reported by Dr. Weir Mitchell, and of course it is possible that the fractured end might enter a subclavial vein or artery.

Dr. Royal Whitman has recently pointed out that the shortening of the clavicle, which repair in most cases brings about, might shorten the support of the scapula sufficiently to promote a tendency to rotaro-lateral curvature of the spine.

Symptoms.

Crepitus is usually felt in delivery at the time of fracture, a faint audible snap. This is sometimes misleading, because in a case where the snap was heard, the writer, after careful examination, could make out no fracture. Deformity is as marked as in an adult, particularly when the fracture is complete. Tenderness, apparently, is always present. How significant it is in childhood is still questioned. Pseudo-paralysis may be due to this same tenderness, but may be confused with a true brachial paralysis. A false point of motion, owing to the lax joints of infants, is difficult to make out.

Treatment.

If the infant were a girl, and there were any doubt about future deformity, the child should be strapped to a board or a Bradford frame, with the shoulders back. Otherwise Sayre's strapping, as used for adults, and applied for ten days, is sufficient. If not treated, after two or three months a careful examination will usually fail to reveal deformity.

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Fractures of Scapula.

There are none in this series.

Wagner reports one case with a somewhat obscure history in the University Med. Mag., Philadelphia, April, 1894.

No.	Number of Hospital Record.	Previous Children.	Para.	Month of Gestation.	Conjugate.	Presentation.	Dystocia.	Operation.	Difficulties of Operation.	Result to Mother.	Length of Child.	Weight of Child in Pounds.	Sex of Child.	Cause of Fracture.	Position of Fracture.	Condition of Bones.	Symptoms.	Treatment	Callus.	Time of Union.	Deformity.	Function.	Final Result.
1	36	9 alive; 1 transverse.	X.	10	.....	L. Scap. P.	Placenta prævia; prolapsed funis.	Podalic version; breech extraction.	Arms locked behind head.	Good.	.....	8½	Male	Attempts to dislodge right arm first.	Right shaft, upper ⅓.	Normal	.....	Small splints: soft bandage.	.....	8 days (?)	Yes.	Good.	Twenty-first day refractured; two months later position and function good.
2	57	2 born dead.	III.	10	.....	L. S. A.	Pelvis small (?)	Breech extraction.	Great force used; arms extended.	"	.....	.....	Female	Attempts to sweep first arm reached across face.	Right shaft.	"	.....	.....	.....	.....	.....	.....	Still birth.
3	547	2 miscarriages.	III.	10	4 inches.	"	Pelvis small; prolapsed funis.	" "	Arms extended.	"	.....	21 in.	"Large"	"	Delivery of extended arm first.	Left shaft.	"	.....	.....	.....	.....	.....	Still birth, due to delay in delivery of head.
4	740	3 alive.	V.	.....	.....	Vertex (?)*	.....	.....	.....	.....	.....	.....	Male	.....	Left middle ⅓	"	Crepitus; arm held rigid; soft parts greatly swollen.	Arm across chest; soft bandages; pasteboard splints.	Large callus when first seen.	11 days	No	Good.	Two months later position and function good.
5	3,394	(?)	III.	10	Ext. conjugate, 7¼ in.	Brow, R. O. A.	Small pelvis; deformity (?)	High forceps unsuccessful; podalic version; breech extraction.	Arms extended.	Slow recovery.	20 in.	7½	"	Extraction of first extended arm.	Right shaft.	Early ossification skull.	Facial paralysis from forceps; temperature, 98°; possible paralysis left side (?)	Arm across chest; soft bandages; pasteboard splints.	.....	14 " (?)	.....	.....	One year later child was microcephalic idiot; no paralysis; so continues.
†6	3,456	2 alive.	VI.	10	....	L. Scap. A.	Jutting promontory; placenta previa.	Podalic version; breech extraction.	Arms locked behind head.	Good.	.....	21 "	Female	Extraction of first extended arm.	" "	Brittled (?)	Fracture of skull as well.	Arm across chest; soft bandages; pasteboard splints.	Small	11 " (?)	.....	.....	Good.
7	4,360	4 alive.	V.	10	....	"	Malposition fœtus; prolapsed funis.	Podalic version; breech extraction.	Left arm extended.	"	.....	20 "	Male	Great force used in extraction of extended arm.	Left middle ⅓	Normal	.....	Starch bandage around chest, to which arm fastened with starch bandage.	"	14 "	.....	.....	Good one month after.
8	4,540	2 alive.	III.	9	4 inches.	R. G. A.	Justo-minor pelvis; prolapsed funis.	Podalic version; breech extraction.	None.	"	.....	18 "	6½	Unknown.	Right shaft	"Poor"	Delayed respiration	Starch bandage.	.....	9 " (?)	.....	.....	Said to be "O.K."
9	4,582	Previous labors easy.	V.	10	....	R. S. A.	None.	Breech extraction.	"	"	.....	19 "	7	"	Right epiphysis (?); probably not.	?	No deformity; arm held rigid; crepitus marked; not noted until 5th day.	Soft bandage; arm to side.	Not noted.	15 "	.....	.....	One year later "O.K.;" no shortening.
10	5,010	1 born dead.	II.	10	3 inches.	R. O. A.	Albuminuria; deformed pelvis.	Symphysiotomy; podalic version; breech extraction.	Dorsal displacement right arm and delay in extraction head.	" 37 days	.....	20 "	9	Extraction of arm across back of child.	Right shaft; "partial dislocation of shoulder."	Normal	No crepitus; mobility in one direction only; deformity, "green-stick."	Small wood splints; soft bandages.	Large	18 "	.....	.....	Six months later one arm as good as other.
11	5,523	Previous labors easy.	V.	10	....	L. Scap. P.	Malposition fœtus.	Podalic version; breech extraction.	Right arm caught behind symphysis.	"	.....	20 "	8	Extraction of arm purposely across back of child.	Right shaft	"	Arm held rigid	Splints; soft bandage; arm across chest.	.....	19 "	.....	.....	Thirty-three days later position and function good.
12	5,714	....	I.	10	.....	R. S. A.	Displacement of fœtal parts.	Breech extraction.	Feet and arms extended.	Perineum badly torn; final recovery.	20½ "	8	Female	Extraction of arm across back of child.	Left upper ⅓	"	Crepitus	Splints; soft bandage; arm across chest.	.....	19 "	.....	.....	Twenty-three days later position and function good.
13	5,837	Previous children alive.	V.	10	....	" of twins.	Locking of twins.	Breech extraction (podalic version on other child).	Arms extended.	Good.	17 "	6	"	Arm caught against second child.	Left (?) middle ⅓	"	Crepitus; mobility	Plaster case removed on eleventh day.	.....	11 " (?) O.K. at that time.	Yes.	"	Twentieth day refracture suspected, but refused.
14	6,000	Previous children alive.	II.	10	.....	L. S. P.	None	Breech extraction.	Child's heart rapid and weak; arm behind head.	"	.....	18 "	7½	Extraction of arm across back of child.	Left upper ⅓	"	....	Plaster case around body; arm bound to case.	.....	9th day turned over to physician.	No	.....	"	Six months later reported "all right."
15	7,312	2 previous abortions.	III.	10	3½ inches.	L. S. A.	Justo-minor pelvis.	" "	Left arm extended.	"	.....	18 "	6	Female	Arm delivered with undue force.	Left middle ⅓	"	Splints for two days, then plaster case.	.....	.....	.....	.....	Unknown.
16	7,121	Previous labors moderately easy.	VII.	10	.....	"	Prolapsed funis and foot.	" "	Arm extended; body transverse.	"	....	19½ "	6	"	Right upper and middle ⅓.	"	Arm across chest; splints; soft bandages.	Large on 8th day.	11 days	"	"	Good.
17	7,005	1st labor hard; 3d, easy; children alive.	III.	10	4 inches.	Vertex (?)	Prolapsed funis; deformed pelvis.	Podalic version; breech extraction.	Arms extended.	"	.....	21½ "	9½	Male	Arm extracted with force through narrow pelvis.	Left shaft	"	.....	.....	.....	.....	.....	Still birth, due to difficult delivery of head.
18	7,083	1 alive.	II.	10	....	R. O. A.	Placenta prævia.	Accouchem't forcé; podalic version; breech extraction.	" "	Perineum torn badly; good recovery.	22½ "	8	"	Extraction of extended arm.	Left lower ⅓	"	.....	Basswood splints two days; starch bandage; arm across chest; bit comly around arm.	.....	14 days (?)	Yes; slight bend of arm.	Good	Slight deformity; good function.
19	8,580	Labors easy.	VIII.	10	4½ inches.	"	....	....	....	Good.	.....	10½ "	10	"	Arm	?	.....	Starch bandage; arm across chest.	.....	21 "	No.	"	Good.
20	8,610	3 previous still births.	IV.	10	Narrow.	R. S. A.	Narrow pelvis	Breech extraction.	Arms extended: right caught between child's head and symphysis of mother.	"	22 "	8½	"	Extraction of second arm.	Left upper ⅓	Normal	Crepitus	Starch bandage; arm across chest.	.....	20 "	.....	.....	Twenty-five days: good.
21	8,651	1 transverse; 4 miscar.	VI.	10 (?)	....	L. M. A.	Malposition of child	Podalic version; accouchem't forcé; breech extraction.	Refused treatment on 3d day, then well.	.....	.....	.....	Female	Extraction of first arm through contracted cervix.	Right upper ⅓	"	Crepitus; temperature, 97°; delayed respiration.	Soft bandage; arm across chest.	.....	.....	.....	.....	Death of child on second day; cause not noted.
22	8,710	Previous labors easy.	VI.	10	Ext. conjugate, 3¼ in.	L. Scap. A.	Malposition of child; prolapsed funis ..	Podalic version.....	Arms extended.....	"	21 "	10	Male	Extraction of extended arm.	Arm	"Bones small." (?)	.....	.....	.....	.....	.....	.....	Still-born, due to delay in delivery of head.
23	9,075	Previous labors easy.	IX.	10	4½ inches.	L. O. P.	Mal position and large size child; probably "missed" labor.	Extraction of child; rotation of shoulders.	Shoulders transverse; child large.	Good.	.....	23 "	15	"	Fingers in axilla forcing right shoulder anterior.	Right upper ⅓.	Normal	.....	.....	.....	.....	.....	.....	Still-born, due to delay in delivery.
24	9,893	5 easy labors; 3 miscar.	IX.	10	.....	R. O. P.	Malposition child; uterine inertia.	Low forceps	None	"	.....	24 "	12	Female	Not broken at birth but noticed 3 days later; due to lifting by one arm.	Right upper ⅓; epiphysis (?)	"	Crepitus soft; arm paralyzed; cry on movement.	Plaster case around thorax; another around arm across chest.	Large	28 days	No	Good	Good.
Case of Dr. Palmer in private practice			I.	10	4½ inches.	R. O. A.	Albuminuria; jutting promontory.	Accouchem't forcé; podalic version; breech extraction.	Arms extended.	"	.....	10½ "	9	Male	Extraction of first extended arm.	Left upper ⅓	"	Night cry; pseudo-paralysis; crepitus; mobility.	Plaster case to body and arm; arm swelled and plaster loosened.	Large callus; ten days to union.	30 "	.....	"	.....	Five months later position and function perfect; no callus.
Case of Dr. Markoe in private practice; noted under fractures of skull.			I.	10	.....																		

* Woman had been delivered by midwife two days previous.

† Also under fractures of skull.

Fig. 6.—C. N. 12,027. Fracture of Humerus.

Fig. 7.—C. N. 12,027. Fracture of Humerus Seventeen Days after Birth.

Fractures of the Humerus.

The radiographs (Figs. 6 and 7) here shown of C. N. 12,027, to be reported in next series, although somewhat dull, indicate the ordinary overlapping of the fragments. These pictures are opposed to Dr. Reynolds' assertion that most of these fractures are "green stick." Only one in this series of twenty-six cases was of that character. The second picture shows the callus formation after seventeen days. The arm is firm, and externally shows no deformity.

Etiology.

In this list it will be noticed that in all but four citations a breech had been extracted, either breech presenting or after podalic version. One of the three is C. N. 780, delivered by midwife. The mechanism is unknown. C. N. 5,723 should not be counted an accident; the arm caught behind the symphysis, was purposely swept across the back, necessarily breaking it, because the operator feared to delay in the interest of the child's life. In delivery of the breech this is the danger always taught to students, the inexcusable sweeping of arms behind the child's back, particularly the first arm to be delivered. Nearly all the cases in the present list were breech extractions in which the arms were extended above the head. In narrowed pelves, under conditions when rapid delivery seems essential to the life of either mother or child, the act of sweeping a child's arms across its face is accomplished with great force. Pressure is exerted as in a lever of the first class. The accoucheur's finger is a fulcrum, with the child's forearm and lower half of its humerus as the long arm of the lever against the whole uterine and abdominal pressure. The fixed upper half of the humerus is the short arm. In such conditions breech extraction endangers the child's arms. C. N. 9,575 was extracted by hooking the finger beneath the shoulder; a similar fracture of Gurlt's was made by a blunt hook in the axilla; and a fillet in the axilla broke an arm for Charpentier. All were vertex cases.

In Hamilton's "Fractures" Dr. Stephen Smith quotes a case of Dr. Fanning, when in a vertex presentation the arm arrested behind the mother's symphysis was broken by uterine force alone. If the arms are extended beside the body of a child in a vertex presentation, while the body is passing out of the vagina, around a symphysis which impinges against the humerus, it is possible that the humerus might be fractured in the same way that Reynolds has shown the femur may be broken. The lifting of a child by one arm, as in C. N. 9,886, has long been known as a cause of shoulder dislocation, of separation of the epiphysis of the humerus or scapula, or of fracture of the shaft of the humerus. Sixteen of these twenty-six children were males, all of them large, one weighing fifteen pounds (the size apparently the sole cause for still birth and fracture). All the cases were at full term, twenty-three in multiparæ, in whose children fractures of extremities seem more common than in children of primiparæ, perhaps because of the greater liability to large children. Some operative interference was required in all cases but two.

Complications.

Deformity is usually the result of improper treatment, but in time corrects itself. Musculo-spiral paralysis has been noticed, but, as Erb points out, Russian children, with the arms tightly swathed to the body and allowed to lie for a long time on one side, often suffer from musculo-spiral paralysis without fractures. This paralysis may also take place from too tight bandaging (Loviot), and has been due to the inclusion of a nerve in callus.

No case of shortening from epiphyseal separation or chronic osteitis has appeared as yet in this series, nor have any cases of epiphysitis.

Prognosis.

Two of the humeri in this series needed refracture, but the one which refused treatment had very slight deformity two years later. Six cases were still-born or died within forty-eight hours. Probably the deaths were from other causes than the fracture, in view of the recovery of two children with fracture of the skull as well as of the humerus. Unfortunately no autopsies were to be had to prove this assertion.

Within seventeen days these fractures usually solidly unite, although at the ninth and tenth days many of them appear perfectly firm, notably those near the ends of the shaft and those in good position.

Symptoms.

A snap is heard at the moment of fracture; crepitus is often faint, and like that of an old blood clot rather than that of adult bone. An abnormal point of motion is usually easily made out. This may, however, be obscure if the fracture be under the deltoid muscle, or if the periosteum be not divided. Deformity is not often marked, as the muscles are too weak to hold the bone in an abnormal position. The writer has found most of these fractures complete (not "green stick"), the line of fracture nearly transverse, with little or no splintering, in the upper one-third of the shaft, about the insertion of the deltoid muscle. If fracture be unnoticed for some days, the large callus often developed may call attention to it. The children are irritable and cry out at night in the same way that osteoscopic pains cause "night cry" in older children. The arm hangs useless, and is tender on manipulation.

Diagnosis.

The physician should distinguish a fracture from Erb's paralysis with its late dislocations of shoulder joint; from pseudo-paralysis of syphilis (osseous dystrophy); from fœtal malformation and from dislocation. Bruns has reported an intrauterine sarcoma of the humerus, which would be hard to distinguish from the callus of an intrauterine fracture. The Röntgen photography will probably help greatly in differentiations.

Treatment.

The writer believes that a gypsum (plaster of paris) case around the chest, and the arm bound to the case after reduction of the deformity, either with plaster, starch, or ordinary gauze bandage, meets all the requirements of immobilization. If not applied with care, this may impede respiration. A towel folded over the chest and removed after the plaster is hard, prevents that danger. This dressing may cause erythema, desquamation, and even erysipelatous-looking eruptions, which render the patients exceedingly uncomfortable. Drying powder and white flannel beneath the dressing usually eliminates this difficulty. If the arm be bandaged to a well-padded case there will be no danger of gangrene or of musculo-spiral paralysis due to pressure. It is well to caution the nurse against permitting a child to lie on the injured side, even if well protected by a solid case. Splints are exceedingly unsatisfactory, because they slip readily and cause permanent deformities, which may require refracture. Such slipping may delay union, as in three cases of this list. If gypsum, silicate, or starch bandages are not used, it is better to bandage the arm to the side of the chest with cardboard at the inner side of the arm, because then there is less liability to displacement than with splints. The enforced absence of bathing does the child no harm, and may be a distinct advantage.

These are ideal cases for the treatment by massage without retentive apparatus, on account of the weak musculature, small liability to spasms or reproduction of reduced deformity, and on account of their rapid healing even without treatment. The child will hold a fractured arm approximately still, and displacement, therefore, can only take place by nursing and handling.

Bibliography of Fractures of Humerus.

General references above.

Hamilton: 8th ed., Philadelphia, 1891, p. 227.

Lowenhardt: Am. Jour. Med. Science, Philadelphia, Jan., 1841, p. 250. Western Med. and Surg. Rep., St. Joseph, Mo., Jan., 1891.

Gerber: Der Kinder Arzt., Worms, May, 1893.

Loviot: Ann. de gynecolog. et obstet., Paris, June, 1895.

Berry (J. J.): New England Med. Month., Newtown, Conn., 1892–93, p. 257.

Kleber (J. C.): Handel v. h. Genersk. Genootsch., Amsterdam, 1777, p. 251.

Fractures of Forearm.

None in this series.

Fractures of Pelvis.

There are none in this series. As the pelvis in the fœtus is relatively smaller than the shoulder or cephalic girdle, and well covered, there is very little danger of its breaking. Ruge, however, reports three cases of rupture at the sacroiliac joint.

Bibliography.

Ruge: Ztschr. f. Geburts. u. Frauen Kr., Stuttgart, 1875–76, p. 68–90.

Fractures of Femur.

Etiology.—In breech presentation or in podalic version, if the child's leg be extended behind its back, the leg is certain to be fractured or dislocated. In podalic version or breech extraction, the leg should be flexed on the thigh, and the flexed limb rotated inward and extended across the abdomen. The second leg is probably usually the one fractured. The mechanism of fracture of the femur by uterine force alone is skilfully depicted by Reynolds (Practical Midwifery, N. Y., 1892, p. 248) as follows: "In breech presentation with the sacrum posterior, the mid point of the flexed femur (leg extended) is pressed against the symphysis pubis of mother with sufficient force to break the infant bone." Mensinga reports a case fractured by the use of the blunt hook as tractor in groin; Matthews Duncan one when the tractor in groin was a fillet. If, as in the case in this series, the promontory jutted forward, traction on the foot would bend the femur across such a promontory, while the body of the child firmly held the upper part of the infant femur well behind the eminence, and a fracture was as easily accomplished as if the bone were broken across the knee.

Prognosis.

The prognosis is as regards life good, but not as regards shortening. Shortening particularly appears if, as is usually the case, the fracture occurs above the junction of the upper and middle third of the bones. The uncompensated action of the psoas iliacus muscle tends to tilt forward the upper fragment. The diagnosis is easy, save possibly from congenital dislocation, later from shortening due to epiphyseal separation, from bending of the neck of the femur (Whitman), or from the sciatic paralysis mentioned by Erb as occurring in breech deliveries with extended thighs or by traction upon the foot.

Symptoms.

The symptoms are the same as in fractures of the humerus, but the anatomical position modifies their relation, and the deformity is more marked, owing to the stronger muscles in this part of the body.

Treatment.

A double Liston splint from both axillæ to the heels, with a cross-bar at the feet, separating the thighs, for convenience in dressing and cleansing the child, or a Bradford frame are good when the fracture is in the lower half of the bone. Immobilization is thus more conveniently secured than by a single splint, plaster, or by suspension of the child by the legs.

In fractures in the upper third, the method suggested by Dr. Wyeth would probably give the best results: that is, the leg flexed upon the thigh, and the thigh upon the body, until the fragments of the broken femur are in accurate apposition and so fixed by a gypsum case left on for two weeks.

Bibliography of Femoral Fracture.

Partridge: quoted above.
Mensinga: quoted in Brit. Med. Jour., London, March 14, 1891.
Wyeth: N. Y. Med. Jour., July 4, 1891.
Gravell: Med. News, Philadelphia, May 13, 1893.
Owings: Med. News, Philadelphia, Nov. 25, 1893.
Erb: Ziemsen Cyclopædia, 1876, xi., p. 567.
Breisky: Prag. Med. Wochenschrift, 1879, ix., 244.
Morton: Lancet, London, 1878, i., 223.
O'Farrell: Phila. M. Times, 1876–77, vii., 125.
Ten Eyck (A. P.): Med. Ann., Albany, 1880, i., 9–11.

Fractures of the Tibia and Fibula.

There were no fractures of this character in the series. Such a case occurred in the indoor service of the Hospital, however, and will be reported in detail at some future time. See history *e*, C. N. 225 (indoor history).

Bibliography on Fractures of the Tibia and Fibula.

Simpson: Obs. J. W. Brit., London, 1880, viii., 553.

Multiple fractures, not at once causing fatal issue, seem from these histories to do better than in adults, in whom shock is a greater factor. Shock, if occurring at all in infants, would probably be only a respiratory stimulus. The child with both clavicles fractured and the one with skull and humerus both did very well.

Summary.

Coston says the dangers of breech deliveries to a child are: pressure on the cord, asphyxia, traumatisms to the head, intracranial hæmorrhages, slipping of an arm over the head, fractures of the humerus, contraction of an incompletely dilated os uteri around the neck of the child. The writer would add: fracture of the clavicle, Erb's paralysis from the Smellie-Veit method of delivery, fractures of the femur from extended legs, sciatic paralysis, fractures of the tibia from the use of a fillet.

Bibliography.

Coston: Therapeutic Gazette, Detroit, 1896, xxxv., p. 604.

PLACENTA PRÆVIA.

By George R. White, M.D.

Among the first 10,000 cases delivered by the Hospital were 31 cases of placenta prævia, which are presented briefly in the table on opposite page.

Definition.

This term was first used to designate a placenta that was supposed to have become detached and gotten below the head of the child. At present the term means an implantation of the placenta in the lower part of the uterus covering more or less of the zone which must dilate during labor. Before labor begins, this zone extends between 2½ and 3 inches above the internal os. When the placenta occupies part of this zone, but does not extend over the dilated cervix, the condition is called "placenta prævia marginalis;" when the dilated cervix is covered partly with placenta and partly with membranes, it is called "placenta prævia partialis," and when the dilated cervix is covered entirely by placenta, it is called "placenta prævia centralis." The latter term does not imply that the placenta is directly central, as that is a condition rarely met with. Many writers, including Parvin and Müller, make but two subdivisions, complete and partial.

Frequency.

This condition occurs 31 times in 10,000 cases, or 1 to 322. This number is somewhat higher than the normal ratio, since some of the patients were consultation cases referred to the Hospital by outside physicians and midwives. In over 800,000 deliveries tabulated by Müller, this condition occurred about 1 to 1,000; and in 600,000 cases tabulated by Parvin, it was present about 1 to 1,200.

The distribution of our cases has been very uneven. Thus there were 6 among the first 500 cases, while at another time there were over 2,000 deliveries with but a single case of placenta prævia. This unequal distribution is also noted by Saxtorph and by Nägle (E. Rigby, Midwifery, p. 504), who states that in some years placental presentation is so frequent that it seems as if it were almost epidemic.

Confinement Number.	Age.	Para.	Month.	Presentation.	Position.	Location of Placenta.	Hæmorrhage.	Condition of Cervix.	Treatment.	Duration of Operation.	Results to Mother.	Remarks.	Child.		
													Condition.	Weight.	Remarks.
										Min.				*Lbs.*	
36	36	X.	9	Shoulder	R.Sc.P.	Marginal	17 hrs..	Dilated	Accouchement forcé	.....	Lived.	Postpartum hæmorrhage; 3 pounds.	Living...	...	Fracture of humerus.
202	33	VIII.	7	"	L.Sc.A.	Central..	First at 5 mos.	1 finger.	Barnes's bags; accouchement forcé.	15	"	" " 5 "	"	$5\frac{6}{16}$	
349	34	II.	$8\frac{1}{2}$	"	Not recorded	Marginal	... .	2 fingers	Accouchement forcé	55	Died..	Died of pulmonary œdema, 3d day..	" ..	5	
398	27	II.	7	Breech..	L. S. A.	Central..	2 days.	Dilated	Membranes ruptured; foot brought down.	.....	Lived.	Slight postpartum hæmorrhage.....	Still-born	$4\frac{1}{2}$	No heart heard; mother felt life 28 hours previously.
446	24	I.	6	Vertex..	.....	Partial ..	A week	3 fingers	Manual dilatation; forceps; version.	...	"	Twins.....	"	3	Skull fractured.
				" ..									"	$2\frac{1}{2}$	
455	20	II.	6	.....	.....	Central..	.....	.....	Barnes's bags inserted.	.....	.....	Intoxicated; refused treatment; undelivered.			
729	22	I.	9	Vertex..	R.O.A.	Marginal	.....	.....	No treatment.....	.....	Lived.	Placenta covered part of cervix, but thin.	Still-born	$8\frac{1}{2}$	Heart not heard.
939	27	II.	6	" ..	.....	Partial ..	.....	2 fingers	Accouchement forcé	.....	"	Twins.....	" "	.....	Cervix contracted about neck; decapitated.
				" ..									"		
1,198	36	VI.	6	" ..	....	Marginal	12 hrs..	"	Tamponed by outside physician; Barnes's bags; accouchement forcé.	.....	Died; 36 hrs.	Rupture of uterus			
1,738	22	II.	9	Shoulder	L.Sc.P.	Partial ..	.....	Closed..	Accouchement forcé	30	Lived.	Arms extended.	Living...	5	
1,758	18	II.	7	"	.....	" ..	5 hrs...	.....	" "	... .	"	.....	Still-born	.....	Heart not heard.
2,182	28	I.	8	"	R.Sc.A.	" ..	3 in 2 mos.	2 fingers	" "	.....	"	....	"	6	Heart heard; not counted.
3,466	32	VI.	9	"	L.Sc.A.	Central..	3 hrs...	3 fingers	Barnes's bags; accouchement forcé.	.....	"	Postpartum hæmorrhage; uterus packed; arms extended.	Living...	$8\frac{1}{2}$	Depressed fracture parietal bone; fracture of humerus.
3,562	30	IX.	9	"	L.Sc.P.	" ..	" ...	1 finger	Accouchement forcé	5	Died; 4 hrs..	In shock when operated	Dead	$11\frac{1}{2}$	Heart heard after birth.
3,595	33	IV.	8	"	R.Sc.P.	" ..	2 lbs ...	2 fingers	" "	10	Lived.	.....	Living ..	5	
3,671	25	IV.	9	Vertex..	L.O.A.	Partial ..	.....	Closed..	" "	25	"	....	"	7	
3,876	22	II.	8	" ..	" ..	" ..	$3\frac{1}{2}$ hrs..	2 fingers	" "	.....	"	Placenta adherent	"	$6\frac{1}{4}$	
3,886	28	IV.	9	" ..	"	Marginal	.....	... .	Vaginal tampon.....	....	"	Tampon forced out by advancing head.	"	$5\frac{3}{4}$	
3,948	25	III.	7	" ..	"	Partial ..	2 weeks	Dilated	Vaginal tampon by midwife; accouchement forcé.	.....	"	....	Still-born	6	
4,293	43	IV.	8	" ..	"	Central..	Sever'l days.	2 fingers	Accouchement forcé	3	"	Placenta markedly lobed	Living...	$6\frac{1}{2}$	
4,800	36	IV.	8	" ..	R.O.A.	Partial ..	.....	3 fingers	" "	25	"	.....	" ...	8	
5,066	19	II.	8	" ..	L.O.A.	Marginal	12 hrs..	Dilated	" "	30	"	Breech left in cervix 10 minutes after version.	Died	6	Gasped a few times.
5,464	30	IV.	6	" ..	R.O.A.	Central..	.....	.....	Vaginal tampon.....	....	"	.....	Still-born	$3\frac{1}{2}$	
6,231	25	I.	8	" ..	L.O.A.	" ..	.....	.....	Barnes's bags; accouchement forcé.	15	"	Hæmorrhage at 4th, 6th, and 7th months.	"	$4\frac{1}{2}$	Cord pulsated before version.
7,374	26	V.	9	" ..	"	Marginal	... .	.....	Vaginal tampon.....	.....	"	Vagina packed 20 hrs.; labor normal.	Living...	7	
7,469	26	V.	9	" ..	"	"	.....	Dilated	Accouchement forcé	10	"	Placenta delivered before child.....	" ...	7	
7,983	29	II.	9	" ..	R.O.A.	Central..	.....	2 fingers	" "	3	"	Hæmorrhage while dilating; arms extended.	" ...	8	Fracture of humerus.
8,034	39	XII.	9	" ..	.....	" ..	.....	"	" "	5	"	Died of sepsis on 3d day	Died	6	Breathed a few times.
8,785	35	X.	$7\frac{1}{2}$	" ..	L.O.A.	Partial ..	.....	"	" "	3	"	.....	"	$4\frac{1}{2}$	Died of atelectasis, 6 hours.
8,978	36	XI.	9	Shoulder	R.S.A.	Marginal	.....	.....	" "	....	"	.....	Living...	9	
9,537	38	X.	9	Vertex..	L.O.A.	"	.....	.....	" "	....	"	.....	Still-born	9	Heart heard in first stage.

Regarding the frequency of the different implantations, there is some difficulty in getting satisfactory statistics, as different methods of classification are adopted. Müller in 270 cases found 20 per cent. central. Townsend (Bost. Med. and Surg. Jour., 1893, p. 129) in his 28 cases found 15 marginal, 8 lateral, 5 central, or 18 per cent. central. Boss (Med. Rec., Feb. 1, 1896) in 135 cases found 28 per cent. central, 61 per cent. partial, and 11 per cent. marginal. These 433 cases give about 22 per cent. central. Our statistics show 10 central (32.2 per cent.); 9 partial (29.2 per cent.), and 12 marginal (38.6 per cent.).

Occurrence.

It is often stated that placenta prævia occurs most frequently in old multiparæ with relaxed uterine walls. Thus Müller gives the proportion of primiparæ as 1 to 6, but that is not far from the normal ratio of first to subsequent pregnancies, and it seems doubtful if multiple pregnancies have anything to do with the occurrence of the condition. Townsend, among 28 cases at the Boston Lying-in Hospital, reports 11, or about 40 per cent. of the cases in primiparæ.

Our cases are distributed as follows:

	Cases.		Cases.
The 1st pregnancy	4	The 6th pregnancy	2
" 2d "	9	" 8th "	2
" 3d "	1	" 9th "	1
" 4th "	6	" 10th "	3
" 5th "	2	" 13th "	1

The second pregnancy furnishes 29 per cent. of our cases.

This distribution seems to be purely accidental.

Etiology.

The cause of the trouble is still unknown. Parvin attributes placenta prævia to a diseased endometrium, which is apt to cause frequent abortions, but among our cases only four had had previous abortions. Many writers are of the opinion that it is simply due to a low attachment of the placenta. Hofmeier (zur Anatomie une Ætiologie der Placenta Prævia, 1890) and more recently Kaltenbach have advanced the theory that the chorionic villi develop in the decidua reflexa as well as in the serotina, and the reflexa subsequently becomes attached to the vera, forming a part of the placenta. If this process takes place in the lower pole of the ovum, the cervix is liable to be more or less covered.

Placenta succenturiata and the other malformations are supposed to be formed by a similar process. Among our cases there was one velamentous insertion of the cord and one markedly lobed placenta. No case of placenta succenturiata was found, although it is not an uncommon complica-

tion. In one case (729) the placenta covering the cervix was so very thin and non-vascular that labor was terminated without any interference. According to this theory, the condition is due to an anomaly of development of the ovum, and the cause is fœtal rather than maternal. Barnes, Hart (Brussels Congress, 1892), Ahlfeld, and others oppose Hofmeier's views and adhere to the theory of the low implantation of the ovum. Hart asserts that it is no uncommon thing for the chorionic villi to grow into the decidua reflexa, but they subsequently atrophy and do not form part of the placenta.

Complications.

Faulty presentations of the child are of common occurrence, owing undoubtedly to the placenta occupying the space usually filled by the presenting part.

Shoulder presentations were seen in 9 of our cases, or in 29 per cent. If these 9 are excluded, this presentation forms less than 0.8 per cent. of the 10,000 cases.

The breech presented but once, and in that case the child was premature. It would seem that placenta prævia does not predispose to breech presentation.

Twins occurred twice.

Symptoms.

The chief symptom of placenta prævia is hæmorrhage. This may come on at any time after the placenta is formed, but rarely before the sixth month.

Those who believe in the theory of the low implantation of the ovum claim that it is a frequent cause of abortion.

Among our 31 cases the first hæmorrhage occurred as follows:

	Cases.		Cases.
In the 5th month	1	In the 8th month	8
" 6th "	5	At or near term	12
" 7th "	5		

Dilatation of the lower segment of the uterus during labor is one of the causes of hæmorrhage, but not the only one, as hæmorrhage sometimes takes place without any sign of labor, beginning perhaps while the woman is asleep. This is probably caused by want of uniformity in growth of the placenta and lower uterine zone. The placental site is supposed to grow more rapidly than the placenta and tear open the uterine sinuses.

Hæmorrhage occurring before labor usually comes on without any warning. The first attack, as a rule, is not severe, but is almost certain to be followed by others, increasing in severity as pregnancy advances. Exceptionally, the first attack may be fatal. In other cases there is a constant oozing of blood, which keeps on until the patient is exsanguinated.

Diagnosis.

The diagnosis is made by feeling the placenta. This may sometimes be done by abdominal palpation or vaginal examination before labor begins.

When the cervix is dilated, the diagnosis presents no difficulty, except in some cases of marginal implantation, in which the edge of the placenta becomes detached from the lower zone and remains suspended in the cervix, surrounded by blood clots. The examining finger may then be passed around the entire lower zone of the uterus without feeling the placenta, and one is apt to make an error unless the entire surface of the presenting membranes be examined.

The diagnosis was not made in any of our cases before hæmorrhage began.

Prognosis.

The prognosis depends largely upon the time the patient is seen, the method of treatment, and skill of the operator.

Müller, in an analysis of 1,574 cases, puts the maternal mortality as not less than 36 to 40 per cent., and the fœtal mortality as 66 per cent. Ahlfeld puts the maternal mortality at 25 per cent. Winckel claims it ought not to be over 5 to 10 per cent., while the fœtal mortality is seldom less than 50 per cent., and often 75 per cent. or more.

Treatment.

No single operation will suffice for all cases, but treatment depends upon the condition of mother and child and the location of the placenta. While some cases do well with a purely expectant plan of treatment or early rupture of the membranes, others can barely be saved by most prompt and skilful operative procedure.

Perhaps the oldest method of treating this condition is that known as accouchement forcé. A satisfactory definition of this term is not easy to find; the dictionaries paraphrase it in several languages, but do not define it. Foster states that it is a forcible termination of labor by version or forceps; but this is a sense in which it is never used. Parvin (Am. Text-Book of Obstet., p. 596) asserts that the term has undergone a change of meaning, which is undoubtedly the case. As used by the older writers, it meant dragging a child through an undilated cervix. As used at the Lying-in Hospital, the term means artificial termination of labor through the natural passages, and includes manual dilatation of the cervix, rupture of the membranes, and rapid extraction of the child by forceps or version, or other operations. No force need be used.

Although this method is condemned by Winckel, Lusk, Parvin, and most obstetrical writers, it is the treatment most in use at the Lying-in Hospital, and at present is used almost exclusively in the severer cases in

which the child is living. The details of the operation are given in a subsequent paragraph.

In the latter part of the last century the vaginal tampon was introduced by Wigand and Leroux. The vagina was packed as soon as the diagnosis was made, and the tampon left in place until it was expelled by the advancing child. Wigand states that in a large obstetrical practice he lost neither mother nor child; but other obstetricians have been less successful, and the procedure is not in general use, except as a preliminary to other measures. Hæmorrhage can be stopped at once by a well-applied tampon, which may be left in place until ready to operate. There is but little danger of severe hæmorrhage taking place above the tampon. Parvin (Text-Book, p. 388) states that no case of the kind has ever been recorded. Recently Dührssen (Deu. Med. Wochenschrift, 1894, p. 422) has reported a fatal case of hæmorrhage into the uterus after the vagina had been tamponed by a midwife.

The tampon is still a favorite method of treatment by Tarnier. As low a maternal mortality as 1.7 per cent. is claimed by its use (Labusquière: Ann. de gyn., Jan., 1896, p. 60). Three cases of placenta prævia marginalis were treated by this method at the Lying-in Hospital, with favorable results to all the mothers and two children; the other child was not viable. These were probably cases which would have done well without any treatment.

Cohen's method consists in detaching the placenta from the lower zone of the uterus and leaving the delivery to nature. Hæmorrhage often ceases when the placenta is partially detached in this manner. This procedure has been used in several of our cases, in addition to other means of treatment, but never alone.

Braxton Hicks, in his work on combined external and internal version, in 1864, made a great advance in the treatment of placenta prævia. His treatment consists in version by the method which bears his name, plugging the cervix with the breech to prevent hæmorrhage, and leaving the child to be delivered by the natural forces. This method is in very extensive use at the present day, and some obstetricians report excellent results as far as the mother is concerned. Thus Dührssen saved all but one of twenty-two mothers, but only three children survived. The same author states that the best statistics show a fœtal mortality of at least 60 per cent. Lusk's statistics show 178 cases treated by eleven operators, with only eight deaths. Other obstetricians are not so successful with this method. The hæmorrhage does not always stop when the breech is brought down. Speigelberg has pointed out that this is because the hæmorrhage does not come from the cervix, the part plugged by the child, but from a point higher.

One case (398) of breech presentation was delivered by this method at the Lying-in Hospital, with favorable result to the mother; the child was dead when the patient was first seen, and this operation was chosen, as only the interests of the mother were considered.

The method most in use at present is often attributed to Barnes. It

consists in fully dilating the cervix with Barnes's bags and delivering the child by version or forceps. The results vary with the different operators. Among the best statistics are those of Thomas (Trans. N. Y. Obst. Soc., vol. i., p. 262), 13 cases, with two deaths; one from sepsis and one from postpartum hæmorrhage. Murphy (Brit. Med. Jour., 1893) reports only two deaths in 62 cases. One of these was from sepsis, and one from hæmorrhage before assistance arrived. The children did not fare so well. Only three lived out of a possible nine. In his later report the children are not mentioned. Dührssen, by using the Champetier de Ribes balloons, lost but one mother in 26 cases. These statistics give but little idea of the mortality by less skilful operators working under less favorable conditions.

At the Lying-in Hospital the Barnes bags have been used five times (Nos. 202, 455, 1,198, 3,466, 6,231)—three times as a preliminary measure for manual dilatation; once the patient refused treatment, and was discharged undelivered; and in the fifth case the uterus was ruptured. The case is given briefly as follows:

No. 1,198.—Russian; VI. para; 36 years; six months pregnant. When first seen the patient had been bleeding about twelve hours; the cervix was dilated about the size of a silver quarter, and the placenta was felt attached low down upon the left side. A Barnes bag was inserted to dilate the cervix; after it had been in place about ten minutes, it suddenly ruptured. The cervix was dilated enough to admit the hand, and the child was extracted by version. Upon introducing the hand again, a coil of intestines was drawn out and the uterus found to be ruptured in the posterior part. The placenta was extracted manually, and the wound in the uterus packed with gauze. The child was still-born, and the mother died thirty-six hours after delivery.

Barnes's bags have not been much used at the Lying-in Hospital for placenta prævia. They are liable to rupture at a critical period and are difficult to make aseptic, unless they are put in the steam sterilizer, which soon spoils them. Moreover, they are entirely unnecessary, as the iodoform gauze tampon and manual dilatation are much more satisfactory means of dilating the cervix.

The balloons of Champetier de Ribes, which are popular in many of the continental clinics, have not been used for this condition.

None of the other methods of treatment described in the text-books or recent literature has been tried.

Choice.

The choice of the operations depends entirely upon the conditions found. The vaginal tampon suffices in many cases, with marginal implantation of the placenta. Braxton Hicks's method is useful if the child be dead or nonviable. Barnes's bags are now rarely or never used. Accouchement forcé is employed in nearly all the severer cases, if the child is living and viable.

Jewett states that patients who have lost much blood stand operation badly, and advises an expectant plan of treatment, as follows: the life of

the child may be disregarded; hæmorrhage checked by a vaginal tampon; stimulants and a small quantity of ergot given; and delivery left to nature, or done after the patient rallies.

Among our 31 cases, one (729) received no treatment; three were treated by vaginal tampon only; one was delivered by pulling down a foot and leaving the delivery to nature; in one case Barnes's bags were used and the case left undelivered, and 25 were delivered by accouchement forcé.

The treatment as carried out at the Hospital depends upon the conditions found. Cases of high marginal attachment of the placenta, in which the lower edge becomes detached and causes hæmorrhage during the first stage of labor, usually require no special treatment, as the hæmorrhage is not sufficient to cause alarm, and the descending head rarely fails to check it. If, however, any treatment be necessary, early rupture of the membranes or a vaginal tampon is all that is required. If the patient is bleeding from a placenta prævia, a vaginal tampon of iodoform gauze is inserted, and kept in place until all preparations for the operation are made. In cases in which the cervix has not begun to dilate, or is not readily dilatable, the cervix and vagina are packed with iodoform gauze, which is left in place four hours or longer, and reinserted if the first tampon has not dilated the cervix or softened it sufficiently to admit of ready dilatation. The operation is carried out under the usual antiseptic precautions, the details of which need not be mentioned here.

After giving an anæsthetic, the patient is placed in the lithotomy position. A hand is passed into the vagina, and dilatation accomplished by gradually working one finger through the cervix, then two fingers, and so on, until the whole hand is admitted. Dilatation is then done rapidly by doubling the hand into a fist while in the uterus and withdrawing it. The operation is often very tiresome. In some cases, as soon as the cervix will admit two fingers, both index fingers are inserted, and traction made laterally in opposite directions.

When possible, the cervix is dilated thoroughly, as it offers considerable resistance to the passage of a head after it will admit a fist. Hæmorrhage is not profuse in the majority of cases, probably owing to the fact that the lower uterine segment is but little disturbed until the cervix is quite wide open. In some cases, however, profuse hæmorrhage does occur, and requires the dilatation and version to be done very rapidly.

In the writer's opinion, Dührssen's incision would be indicated in cases of rigid cervix in which the supravaginal portion is obliterated, and the resistance is at the external os; but no case in our records has required that operation.

After the cervix is dilated, the membranes are ruptured or the placenta is perforated, if necessary, and a foot brought down. Delivery is effected as soon as possible, following the usual methods, being careful to prevent the arms from becoming extended, as delay from the after-coming head is liable to be fatal to the child.

The placenta is extracted manually soon after delivery, as hæmorrhage is apt to persist until it is removed.

The time of the operation varies greatly, owing to the condition of the cervix. It was:

	Cases.		Cases.
55 minutes	1	10 minutes	2
30 "	2	5 "	2
25 "	2	3 "	3
15 "	1		

The exact time was not recorded in the other cases.

The children are frequently premature, and if asphyxiated are resuscitated by the most gentle measures. Continuous swinging and vigorous treatment of any kind is apt to be fatal to these premature babies.

Results.

In considering the results, allowance must be made for the conditions under which the operations were performed. They were all done in tenement houses, with most unsanitary surroundings, and often not seen for several hours after hæmorrhage had begun.

There were four maternal deaths among our 30 cases, or 13.3 per cent. The causes of death were: Sepsis, pulmonary œdema on the third day after labor, hæmorrhage before assistance arrived, and rupture of the uterus.

Of the 32 children, including two cases of twins, six had not reached the age of viability, four were dead when first seen, four died during labor, and three died soon after delivery. This gives a total mortality of 17, or 53.1 per cent. Excluding the nonviable and dead children, 15 were saved out of a possible 22, or a mortality of 31.8 per cent. Of those which died during labor, the death in most cases could be attributed to delay before operating. Of those which died soon after delivery, one was premature and died of atelectasis six hours after birth, and its death was not due in any way to the method of operation.

While these results are not entirely satisfactory, they refute the statement of Paquy (Gaz. med. de Paris, 93, No. 49) and others, that the fœtal mortality is so high that the life of the child should be disregarded.

In a well-equipped hospital, where the cases can be seen early, the maternal mortality ought to be much smaller than these statistics show, and our mortality of 31.8 per cent. of viable children reduced at least a half.

REPORT OF THE CURATOR.

By James W. Markoe, M.D., and Martha Wollstein, M.D.

This report is intended to cover a period of nearly six years, but owing to the impossibility of preparing and storing specimens during the first years, when the work was performed in part at the Dispensary in Broome Street and in part at the laboratory of the Embryologist, it was necessarily incomplete. Thus many of the early specimens were lost, and it is only within the past two years that they have been systematically prepared. Even at the present time, the only place provided for the purpose is entirely inadequate.

It can, therefore, be but an outline of the preparations at present mounted upon the shelves of the Museum, together with the various models.

The wet specimens are prepared either in alcohol or formaline, and are arranged in such an order that they may be referred to during the course of any lecture.

In addition to the wet specimens, wax models and similar preparations have been purchased abroad, and have also been prepared by members of the Medical Board. These form a very valuable addition to the department.

Collection.

22 models of normal pelves, male and female.

22 models of deformed pelves.

2 rubber pelves. *Tramond, Paris.*

1 wax model of the female pelvis (median section), with a portion of the vertebral column, showing the relations of bladder, uterus, and rectum; also the external genitalia. *Tramond, Paris.*

1 ovology set, showing the formation of the ovule in the ovary, its course in the tube, and its fecundation, allowing all the modifications that the germ and its envelopes undergo to be followed from the first to the thirtieth day; that is, from the appearance of the ovule in the ovary to the formation of the embryo. *Auzoux, Paris.*

1 wax model human uterus, pregnant. Three months' fœtus in membranes. *Tramond, Paris.*

1 series of His models of human embryos, comprising 8 models in the first month of development. *Ziegler, Freiburg.*

1 series of His models of human embryos, comprising 8 models in the second month of development. *Ziegler, Freiburg.*

2 models of the development of the human embryo (wax). *Ziegler, Freiburg.*

1 series of His models of chick embryos, comprising 23 models, enlarged forty times the real size. The first 9 models show the development of the first and second days of incubation; the next 4 models show the third and fourth days; numbers 14 to 17 are brain models; 18 to 21, hearts; and 22 to 23 intestine. *Ziegler, Freiburg.*

1 series of His models of the development of the human brain (wax), comprising 8 models from embryos of 4 weeks to 3 months. *Ziegler, Freiburg.*

1 series of Ecker models of the development of the convolutions of the cerebral hemispheres in the human fœtus, comprising 14 models which show 7 stages of development in embryos from 12 to 36 weeks old. *Ziegler, Freiburg.*

1 series of Manz models of the development of the eye in vertebrates, comprising 9 models. *Ziegler, Freiburg.*

1 series of His models of the development of the internal ear (human). Four models in embryos 4 weeks to 2 months old. *Ziegler, Freiburg.*

1 series of Röse models of the development of human teeth. Six models from embryos 2 to 30 centimetres in length; finally, the second temporary and the first permanent molar, just prior to birth. *Ziegler, Freiburg.*

1 series of His models of the development of the human heart. Twelve models from embryos 2 millimetres in length, to the fifth week. *Ziegler, Freiburg.*

1 series of Born models of the development of the mammalian heart, comprising 11 models, magnified sixty times the real size, showing 7 stages of development, including the aortic arches in 3. *Ziegler, Freiburg.*

1 series of Born models of the development of the human heart, comprising 3 models which show 2 stages (beginning of the third and middle of the sixth month) in the formation of the auricular septa and valves. *Ziegler, Freiburg.*

2 models in clay of vagina. *Dr. Lambert.*

3 models of uterus: (1) unimpregnated; (2) first month of pregnancy; (3) second month of pregnancy; natural size. *Dr. Edgar.*

7 corrosive preparations of placentæ. *Dr. Huntington.*

2 models, electrotype, laceration of perineum with sutures in place. Plaster covered with thin layer of copper. *Dr. Edgar.*

2 normal skulls of fœtus at birth. *Tramond, Paris.*

1 skull showing result of occipito-posterior position. *Tramond, Paris.*

2 normal skulls of younger embryos. *Tramond, Paris.*

1 skull of fœtus at birth, showing deep depression of left parietal bone, made by forceps.

1 skull of fœtus at term, showing fracture and over-riding of both parietal bones, the result of craniotomy.

Wet Specimens.

In addition to 100 specimens mentioned in the previous Reports of the Hospital, 32 in the first and 68 in the second, there are 74 which have been prepared and classified as follows:

Placenta and umbilical cord, showing calcareous degeneration, twin, and other abnormalities		5
Umbilical cord, volvulus		1
" " double knot		1
Monsters		5
Hydrocephalic	1	
Anencephalic	2	
Cretin	1	
Diaphragmatic hernia	1	
Twins		4
Embryos		30
Longitudinal median section, showing relations of all the viscera		1
Longitudinal median section, showing all the serous cavities		1
Fœtus at term		3
Fœtal organs		14
Heart, lungs, and thymus gland	4	
Kidneys, ureters, and bladder	4	
Brains (2 hydrocephalic)	5	
Intestinal stenosis	1	
Longitudinal section through thigh, leg, and foot, showing diaphysis and epiphysis of femur and tibia, also patella and bones of foot		1
Uterus of mother from cases of rupture, Cæsarean section, etc		8
Total number		74

Some of the specimens are mounted, others are still in various stages preparatory to a permanent mount in alcohol or formaline.

For several months past the method of Jores,* which aims to preserve the natural color of the organs and tissues, has been used both for embryos and viscera. The results thus far obtained have been eminently satisfactory.

* Centralblatt für Allgemeine Pathologie und Pathologische Anatomie, bd. vii., No. 4.

REPORT OF ORTHOPÆDIC SURGEON.

From April 1, 1893, to April 1, 1896.

By T. Halsted Myers, M.D.

Six thousand seven hundred and sixty cases of confinement were attended by the physicians of this Society during this period.

Sixty cases of deformity were noted, which may be tabulated as follows:

	Cases.		Cases.
Anencephalus	9	Rudimentary tail	1
Absence of fingers and toes	1	Spina bifida	4
" right hand	1	Supernumerary fingers	4
Cleft palate	3	" toes	1
Deformity of hands and feet	1	" fingers and toes.	1
Epiphyseal separation	1	" auricle	2
Hydrocephalus	4	Talipes varus and imperforate anus	1
" and talipes varus.	1	Talipes varus	11
Hare lip	3	Teeth at birth	1
" deformity of genitals, supernumerary fingers and toes.	1	Webbed toes	1
Imperforate anus	3	" fingers	1
Monster	2		—
Phimosis	2	Total	60

Polydactylism.—The cases of supernumerary fingers and toes presented nearly all the varieties known, and the following are detailed as examples:

It was impossible in the first case to secure photographs of the hands and feet, therefore rough sketches are given.

The right hand was normal, except that a rudimentary terminal phalanx, with nail, was attached by a very thin pedicle of skin, one-eighth of an inch long, to the fifth finger, opposite the joint between the second and third phalanges (Fig. 1).

The left hand was normal, except that a similar, but somewhat better developed, terminal phalanx, with nail and cartilage, was attached by a fleshy pedicle to the fifth finger, opposite the middle of the third phalanx (Fig. 2).

The great toe of the right foot has two terminal phalanges, with separate bones and partly divided nail, articulating with a single broader proximal phalanx. The second and third toes are webbed up to the terminal phalanx; the fifth has a double terminal phalanx, each with its nail, but both articulate with the same proximal phalanx (Fig. 4).

The left foot presents a very similar deformity, but in this case the great and fifth toes have all their phalanges double. The sketches show the extent of the webbing in each case (Fig. 5).

The family history in this case is remarkable. This boy's grandfather had six fingers and six toes on both right and left sides. The father had six toes on each foot, but his hands were normal. One brother of the father has polydactylism of hands and feet. Four other brothers of the father were normal. Two of them were married and their children were normal. This child is the sixth and last. Both the first and second of the children, boys, had six fingers and six toes on each side. The third child, a boy, had six toes on one foot, otherwise was normal. The fifth child, a girl, was normal.

The deformity in the second case is unusual: the right hand has a double thumb with double metacarpal bones, and is webbed completely, but has only one nail. The first finger is rudimentary throughout, and has no power of flexion or extension. The second and third fingers are fully developed, but are webbed completely; the fourth finger is normal. The prehensile power of the hand is good, and no operative measures are advised (Fig. 6).

The third case is an example of the simplest form of the deformity. The other members of the family were normal, as far as was known; the extra finger, a poorly developed terminal phalanx, with its nail, was attached by a long, narrow pedicle to the proximal phalanx of the little finger of the left hand (Fig. 3).

A number of the other cases presented deformities similar to those already shown.

Adactylism.—Suppression of both fingers and toes.

Right hand: thumb, metacarpo-phalangeal joint malformed; phalanges slightly adducted; index and second fingers absent beyond the metacarpo-phalangeal joint; little finger normal; third finger is flexed and adducted at the joint, between second and third phalanges (Fig. 7).

Left hand: thumb normal; first finger lacks first and second phalanges; second and third fingers webbed completely; two bones and two nails; fourth finger normal (Fig. 8).

Right foot: great toe adducted; second and third toes, including corresponding metatarsal bones, absent; fourth and fifth metatarsal bones present, but only one toe, which seems to be the fifth, and this articulates with the fifth metatarsal (Fig. 9).

Left foot: same deformity as in the right foot, but in this case it seems to be the fourth toe which is present, and this articulates with the fourth metatarsal. The parents say that the umbilical cord was found passing over the points marked "x," but this explanation is probably incorrect, as

most authorities now think these deformities are dependent upon changes in the embryonal cell mass (Fig. 10).

Torticollis.—Two of the cases of torticollis illustrate different ways in which this deformity may originate. In the first case the deformity was noted a few hours after birth and for the next two days. I saw the child three and a half days after birth, and there was then no deformity of any kind, nor any induration in the muscles of the neck. This is interesting, as congenital torticollis is generally believed due to an actual shortening of the sternocleido mastoid, and cases where the deformity is seen just after birth are commonly ascribed to the irritation of an hæmatoma in that muscle, caused by some traumatism received at birth. In this case it would appear to have been due to a temporary paralysis of the muscles on one side of the neck, allowing their opponents to incline the head in the opposite direction.

The second case was a breech presentation. No deformity was noted at birth. A tumor was first seen fourteen days afterwards in the sternocleido mastoid on the right side, at the junction of the middle and upper thirds of the muscle; the head could be inclined to the left normally, but the rotation of the chin to the right was less by 30 than on the opposite side. This case under massage and manual correction steadily improved, and both the hæmatoma and the deformity entirely disappeared in a few months' time.

Hare Lip.—One simple case with cleft on left side, involving soft parts only, was operated upon with excellent result. The stitches were removed in five days: union was apparently complete, but during some violent fits of crying the wound was torn open. A secondary operation secured a very fair result.

In a second case there was a double maxillary cleft and eversion of præmaxillary bone. The hard and soft palate were also completely cleft. The child was puny, but was able to nurse. She was when last seen three months of age, but not in a condition to undergo the radical operation indicated.

Rudimentary Tail.—This girl when she was four weeks old presented the appearance roughly shown in the sketch; this, however, accurately indicates the relative position and extent of the folds in the gluteal region and the thighs. A tail-like process, 1¼ inches long, with a slight indentation at its extremity, was attached to the gluteal region about 1½ inches to the right of the central gluteal crease. This was excised two weeks later and was found to be a mass of fibrous and fatty tissue attached to the periosteum covering the end of the coccyx, which was itself deflected to a position at right angles with the last segment of the sacrum, and at this point there was abnormally free movement. The anus was situated in the deep fold immediately below this tail-like process, apparently 1½ inches to right of median line. The secondary gluteal fold on the right side, below the fold just mentioned, was of equal depth and extent with the lateral gluteal crease on the left side, as shown in the sketch, and was on the same horizontal plane. There were no other abnormalities noted in this case (Fig. 11.)

Fig.1.

Fig.2.

Fig.3.

Fig.4.

Fig.5.

Fig.6.

Fig.7.

Fig. 3.

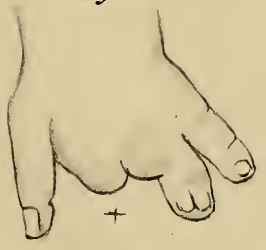


Fig. 11.

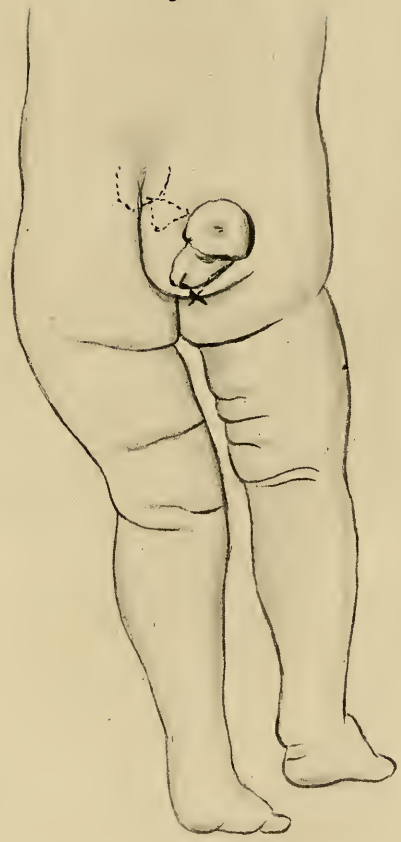
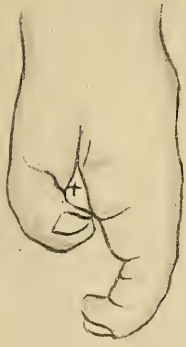


Fig. 9.

Fig. 10.



Many of the severest cases of deformity, such as hydrocephalus, monsters, etc., were still-born.

Club Foot.—Immediately after birth the physician, as a matter of routine treatment, instructed the mother or attendant how to manipulate the feet so as to reduce the deformity as completely as possible. She was told to do this at certain regular intervals, and was also shown how to apply bandages to them when that was necessary. In the more severe grades of the deformity simple retention splints were applied within a few days after confinement. The first object was to overcome the varus. For this purpose a light steel bar with cross-pieces at its extremities to embrace the toes and the calf of the leg was strapped to the inside of the leg and foot after being properly padded. This brace was put on the foot in its deformed position and gradually straightened, a change being made every two or three days, until the foot was brought into a valgus position. The equinus was then corrected by manipulation, or by applying a brace, similar to that described, to the back of the leg and sole of the foot, direct pressure backwards being applied at the ankle by adhesive plaster. The brace was applied in the position of deformity, as before, and the foot-piece gradually brought up to a right angle with the leg-piece. Owing to the very early age at which treatment was begun, tenotomies were rarely necessary. Relapse is almost sure to follow, however, unless a correct position or over-correct position of the foot is carefully maintained for at least a year. Daily exercise to strengthen weak muscles must also be carried out methodically in all these cases.

CONTRIBUTION TO THE TOPOGRAPHICAL ANATOMY OF THE THORAX IN THE FŒTUS AT TERM AND THE NEW-BORN CHILD.

By George S. Huntington, M.D.

The following anatomical conditions, aside from those connected with the circulatory apparatus and dependent upon the placental type of respiration, impress their character most strongly on the arrangement of the viscera in the fœtal thorax, when contrasted with the form and contents of the adult chest cavity.

1. Differences in extent and configuration of the lungs before and after pulmonary respiration has been established.

2. Differences in the extent of the pleural sacs and of the complementary pleural spaces, especially the costophrenic sinus.

3. Presence of the thymus gland.

4. Relative large size of the fœtal liver, influencing indirectly the arrangement of the thoracic contents by determining the level of the diaphragm.

The following memoranda have been compiled from the examination of the thorax and its contents in five fœtus at term, four newly-born infants who died within a few hours after birth, and two fœtus of 25 and 31 weeks (estimated) respectively.

The material has in all cases been prepared by the preliminary injection through the umbilical vein of a ten per cent. formaline solution, at a hydrostatic pressure varying from one to three feet. This hardening fluid possesses peculiar value for the determination of the topographical relations of the body cavities and viscera. In the strength above indicated the œdematous swelling at times observed with the use of weaker solutions is entirely confined to the subcutaneous connective tissues. The deeper parts, especially the viscera, are hardened *in situ* in such a manner as to preserve, even when removed from the body, their correct form, and to indicate most accurately by the surface markings their natural relationship to surrounding structures. The solution is eminently well adapted to the complete hardening and preservation of the lung. The viscus appears of almost rubber-like consistency, and admits freely of manipulation, without the least impairment of the normal shape, and without disturbing the relations

to surrounding structures. The preparations which can be obtained by this method are of the greatest value in determining the topography of the thoracic cavity. More especially is it possible by their aid to deal with the mutual relations of the lungs and mediastinal contents from an entirely novel point of view. The hardened lung reflects accurately its relation to the thoracic parietes and to the structures contained in the mediastinum.

It is especially desirable to formulate a precise description of the thoracic organs in the fœtus for comparison with the same structures in the adult.* In the following communication this attempt has been made, and although the material is not large, yet the uniform disposition of the more important structures in all the preparations examined affords good ground for regarding the conditions described as conforming to the normal type.

The lungs of the fœtus and new-born infant are free from the disturbing influences which in later life pulmonary disease so frequently exerts on the disposition of the thoracic organs. For this reason the study of fœtal material possesses a special value in the regions in question.

The subject matter of these observations may be arranged under the following headings:

I. Form and External Characters of the Lungs.

A. *Surfaces of the Lungs.*

Each lung presents four surfaces—the viscus having the form of a truncated pyramid, with three unequally developed lateral surfaces converging to a blunt apex, the fourth surface forming the broad base by means of which the organ rests on the convex upper surface of the diaphragm.

The general disposition of the side and basal surfaces is best obtained by examining the hardened lungs of a fœtus in the later months.

Figs. I to IV present the medial and lateral aspects of the right and left lungs of a fœtus estimated to be in the twenty-fifth week, and Figs. V and VI give outline representations of the basal or phrenic surfaces of the same lungs.

The sharp anterior margin (Figs. V and VI, 2) admits readily of the usual division into a lateral or sternocostal convex, and a medial or mediastinal concave surface.

While this sharp differentiation exists along the entire well-defined anterior margin of the lung, the arrangement of the posterior thick portion presents, in the organ detached and removed from the body, greater difficulties. The correct appreciation of this portion of the lung depends upon exact reference to the mediastinal structures and to the part of the thoracic wall with which the same comes into contact.

The examination of the basal outlines of these fœtal lungs shows that

* While this paper was in press, Dr. J. A. Blake, of Columbia University, presented the results of similar investigations of the adult thorax to the Association of American Anatomists at Washington in May of this year. His paper will be published in the Proceedings of the Ninth Annual Meeting of the Association, and will form a very valuable sequel to the present communication.

each presents a cast of its side of the thoracic cavity. The following surfaces can be distinguished:

1. *Sternocostal surface* (Figs. V and VI, 1) extends transversely between the sharp anterior margin (2) and the blunt posterior margin (6), fitted against the concavity of the parietal pleura lining the internal surface of the thoracic wall from the posterior surface of sternum and costal cartilages in front to the line marked superficially by the costal angles behind.

2. *Mediastinal surface* (Figs. V and VI, 3) is included between the anterior (2) and internal margin (4), concave in main, directed inward and somewhat forward in the posterior part, modelled upon the contents of the anterior portion of the mediastinum, especially upon portions of the pericardium, thymus gland, and large vessels covered by the mediastinal pleura.

3. *Costovertebral surface* (Figs. V and VI, 5) directed backwards and inwards, included between the internal (4) and posterior borders (6). This surface is applied to that portion of the parietal pleura which covers the sides of the vertebral bodies and intervertebral disks, the heads of the ribs and sympathetic nerve strand, and the anterior surface of the necks and bodies of the ribs as far out as the point where the latter change their original outward and backward direction to curve forward in the lateral thoracic wall.

The principle adopted in the above definition of the lung surfaces is afforded by the direction of the surfaces, the presence of distinct margins, and the relations to thoracic contents and walls. The mediastinal surface is taken to include all that portion of the medial aspect of each lung which comes indirectly, by means of the interposed mediastinal layer of the parietal pleura, into contact and relation with the visceral, vascular, and nervous structures contained in the mediastinal space. This is quite readily apparent in the anterior parts of this surface, where large impressions exist for adaptation to the bulky thymus gland and pericardium. In the posterior portion of this area the relation to structures entering and leaving the lung at the hilus is well defined, from the intimate connection of these parts with the pulmonary substance. But above, below, and behind the hilus the mediastinal surface of the lung comes into contact with the pleura covering vascular and visceral structures which pursue in main a vertical course in the posterior mediastinum.

The published descriptions of the anatomy of the lung separate a sternocostal and mediastinal surface by the sharp anterior margin, and state in general that posteriorly these pass into each other by means of a thick, rounded posterior border. Even to take the posterior margin of the aortic groove as separating the mediastinal from the parietal surface of the left lung, and the posterior margin of the azygos furrow as separating the corresponding portions of the right lung, is not correct. In the detailed consideration of the relations of the mediastinal pulmonary surfaces, given below, it will be seen that the character of this area is complex, coming into relation with successive structures as they approach or recede from the posterior part of the mediastinal pleural leaf.

It seems, therefore, more in accordance with the actual conditions to define the mediastinal surface as including that portion of the lung which is in relation with the mediastinal pleural reflection covering the vascular, glandular, visceral, and nervous structures of the mediastinal space.

This area is separated by what we have termed the "*internal*" margin from the surface in contact with the parietal pleura investing the walls of the thoracic cavity. This internal margin, varying in distinctness in different parts of its extent, is, therefore, the composite of the successive posterior borders of a series of impressions which result from the relation of this portion of the lung to the pleura investing the longitudinal vascular and visceral contents of the posterior part of the mediastinal space. The details of this margin will be subsequently considered.

The surface of the lung in contact with the pleura covering the thoracic parietes is generally convex, and in the fœtal lung is quite evidently divided into a *lateral* or *sternocostal*, and *posteromedial* or *costovertebral surface.*

The *sternocostal surface* is limited anteriorly by the sharp anterior margin, in which it meets the mediastinal surface. The posterior limit is afforded by a rounded but distinct border (Figs. V and VI, 6), which fits into the vertical groove formed by the succession of ribs and intercostal spaces at the point where the former change their original outward and backward direction to turn forward in conformity with the lateral curve of the thoracic wall.

The *costovertebral surface* extends between this posterior border and the internal margin, as above defined. As the name proposed indicates, this surface comes into relation with the parietal pleura covering the lateral aspects of the vertebral centres and disks and the portions of the ribs and intercostal spaces which extend between the costovertebral line of articulation and the line indicated superficially by the succession of the costal angles.

B. *Changes in External Form During the Later Developmental Stages of the Lungs.*

In the earlier stages of development the posterior border is sharper, and the costovertebral surface is directed obliquely backward and inward (Figs. V and VI). As the lung develops, the increase in size affects primarily the posterior portions.

Figs. VII to XII present the lateral and medial aspects and the outlines of the basal surfaces of the right and left lungs of a fœtus of thirty-one weeks (estimated).

It will be noted (Figs. XI and XII, 6) that the posterior margin is more rounded, and that the costovertebral surface looks almost directly inwards (Figs. XI and XII, 5). This change in direction produces a diminution in the distinctness of the internal margin (Figs. XI and XII, 4) as seen from the basal surface, since the costovertebral surface forms a more direct continuation backwards of that part of the mediastinal surface which is in relation with the vertical structures occupying the posterior mediastinal space. At the same time it will be presently seen that the differentiation of the two surfaces, as indicated by the impressions produced, becomes more marked with the full development of the lung.

Fig. XIII represents the basal aspect of the lungs of a fœtus at term, together with the inferior surface of the pericardium and attached portion of the diaphragm. The same relative changes are to be noted here.

The *phrenic* or *basal surface* of both lungs is uniformly concave, moulded over the convexity of the diaphragmatic cupolæ. The varying proportions in which the different lobes contribute to the formation of this surface will be considered in speaking of the course of the main interlobar incisures.

C. *External Form, Fissures, Incisures, and Lobes.*

The comparison of the fœtal lung in the earlier stages with the fully developed organ at term shows some characteristic changes in form.

1. *Left Lung.*

The lung represented in Figs. III and IV (25 weeks, estimated) gives the following picture:

Elongated, cone-shaped, the sternocostal, costovertebral and mediastinal surfaces narrowing uniformly and gradually to the apex, which presents a smooth, rounded lateral and slightly concave medial surface.

A slight depression (Figs. III and IV, 2), differentiating the apex proper from the posterior border, is produced by the proximal portion of the anterior margin of the first rib. The anterior margin shows a similar though slighter costal impression (Figs. III and IV, 3), separating it from the apex.

The anterior margin appears crenated by a number of short incisures. One of these, *the anterior marginal incisure** (Figs. III and IV, 4), extends somewhat more deeply upward and backward on the medial surface. A second more deeply marked incisure (Figs. III and IV, 5) appears to foreshadow the development of the typical cardiac curve. These secondary fissures represent rudiments of the occasional additional fissure which in the adult at times extends backward from the deepest portion of the cardiac incisure to meet, in extreme cases, the main interlobar incisure, and thus repeat the intermediate fissure of the right lung.

The lung shown in Figs. IX and X (31 weeks, estimated) exhibits, when contrasted with the preceding, the typical changes occurring in the further development of the organ. The most notable difference exists in the upper and apical portions of the lung. The site of the original rounded blunt apex of the cone is still discernible, both the posterior and anterior margins exhibiting the first costal impression (Figs. IX and X, 2, 3).

The anterior marginal fissure (Figs. IX and X, 4) is well marked on both the lateral and medial surfaces. The extent of the upper lobe, measured along the anterior margin between 3 and 4, and along the posterior border between 2 and the intersection of the main interlobar incisure, indicates a very marked antero-posterior expansion of this portion of the lung.

* It has been considered advisable to designate this fissure of the left lung by a special term, on account of its constant occurrence in the earlier stages and the part it plays in the production of the more important fissural variations of the left lung in the later stages.

In the earlier stages (Figs. III and IV) the anterior margin slopes uniformly and gradually downward and forward from the apex to the anterior marginal fissure (4), at an angle of about 45 degrees with the vertical long axis of the posterior border. In Figs. IX and X the same portion of the anterior margin in the older lungs is seen to pass at first forward from the apex, nearly at right angles with the line of the posterior border. It then abruptly turns downward, and recedes somewhat to the beginning of the anterior marginal fissure (4), developing a blunt, nearly quadrangular superior marginal process, which overhangs the cardiac incisure from above.

Below, the lingula is also produced forward and inward, resulting in the hook-like inferior limit of the cardiac incisure. The formation of the wide cardiac incisure is chiefly to be credited to the forward expansion of the anterior portion of the upper lobe, between the apex and the anterior marginal fissure. The anterior margin of the lung in the region of the cardiac incisure presents the same crenated appearance, although the fissures and indentations are relatively smaller and of less depth than in the first lung.

The changes affecting the lower lobe are best appreciated by considering the course of the main interlobar incisure, the extent of the medial surface of the inferior lobe, and the position of the hilus.

In the first lung (Fig. IV) the main interlobar incisure runs a much more vertical course on the sternocostal surface. Fig. IX indicates by the more oblique course of this fissure that in the later stages the growth has involved more especially the anterior and lateral portions of the inferior lobe, resulting in a sagittal increase of the lower portion of the sternocostal surface. Coincident with this, the relative extent of the inferior lobe on the mediastinal surface is less. In the earlier lung (Fig. III) the mediastinal surface of the lower lobe presents a broad triangular area, forming approximately one-third of the entire mediastinal surface, between the main interlobar incisure, the line of attachment of the ligamentum latum, and the medial margin of the phrenic surface. In the later stage this area is reduced in extent, but much more prominent, forming (Fig. X) a sharp triangular process (pericardio-œsophageal tuberosity), to be subsequently considered in detail with the topographical relations of this surface. It is, however, to be remembered that individual variations in the arrangement of the main fissures and incisures are not infrequent. (See below.) As already stated, reference to the outline tracing of the phrenic surface (Figs. VI and XII) shows an expansion and rounding of the posterior margin and a more sagittal direction of the costovertebral surface.

The uncinate character of the lingular process, curving forward and inward, is also to be noted in comparing the basal surface of the second with that of the earlier lung.

The aortic groove becomes much more distinct in the later stage, and in the view of the medial aspect (Fig. X) the beginning of the costovertebral surface dorsal to the groove is to be observed.

The hilus of the more advanced lung occupies a relatively greater area on the mediastinal surface. This is more especially marked in the inferior portion, resulting in a shortening of the ligamentum latum.

In the further development of the external form of the left lung the changes indicated above lead to the establishment of two quite distinct types.

Instances of these are given in Figs. XIV to XVII, representing the sternocostal and mediastinal surfaces of two left lungs at term.

Type 1. *Lung with well-developed cardiac incisure* (Figs. XIV, XV, and XVIII).

The quadrangular form, noted as appearing in IX and X, is here still further developed, due to the great antero-posterior extent of the superior lobe and marked development of the anterior portion of the same above the cardiac incisure. The quadrangular marginal process forming the upper limit of the latter is especially prominent.

The anterior marginal fissure is present and distinct, appearing both on the sternocostal and mediastinal surfaces.

The cardiac incisure is deep, forming three sides of a rectangle, bounded below by the prominent incurve of the hook-like lingula.

The main interlobar incisure on the sternocostal surface meets the inferior margin at a point which would correspond to the vertical prolongation downward, across the root of the lingula, of the bottom of the cardiac incisure.

On the mediastinal surface the inferior lobe presents an extensive area. The course of the main interlobar incisure, in returning to the anterior margin of the hilus, on the mediastinal surface, follows the type indicated in the earlier stages in Fig. III. The incisure meets the anterior border of the hilus nearly at the middle, and a large triangular area, belonging to the mediastinal aspect of the inferior lobe, presents in its anterior and larger part a concavity for adaptation to the left surface of the pericardium, its smaller posterior and inferior segment forming the prominent triangular œsophageal surface.

Type 2. *Absence of cardiac incisure. Assimilation of external form to that of right lung.*

In strong contradistinction to the preceding form is the superficial configuration of the lung shown in Figs. XVI and XVII.

The entire appearance of the lung suggests the structure usually encountered on the right side. The anterior margin is nearly vertical. There is no cardiac incisure. The anterior marginal fissure is well developed and crosses the sternocostal surface so as to nearly intersect the main interlobar incisure. The anterior margin turns with an obtuse angle into the superior division, sloping slightly upward and backward to the apex.

The upper lobe, compared with the first type, is slightly less quadrangular. Possibly the absence of the cardiac incisure, and the consequent increase in lung substance along the anterior and inferior marginal portions of the lung, accounts for the somewhat smaller sagittal extent of the upper part of the superior lobe.

The middle lobe, which is thus marked out on the sternocostal surface, evidently corresponds to a very highly developed lingula.

On the mediastinal surface the main interlobar incisure follows the course indicated previously in Fig. X. It does not quite reach the inferior part of the anterior hilus margin. The mediastinal surface of the inferior lobe is confined to the strongly developed triangular pericardio-œsophageal tuberosity.

The anterior marginal fissure penetrates on the mediastinal surface backward and upward, covering two-thirds of the distance between the anterior lung margin and the anterior border of the hilus.

The difference in the conformation of the left lung and of the cardiac incisure exhibited by the above types appears to be independent of the development of the thymus gland. In both cases a well-developed typical thymus was present. The large size and pronounced character of the cardiac incisure in the first form (Figs. XIV and XV) would appear to negative the view expressed by some authors,* according to which the cardiac incisure does not make its appearance until involution of the thymus permits of greater expansion of the upper portion of the left lung.

2. *Right Lung* (Figs. I, II, V, VII, VIII, XI).

The right lungs of the two younger fœtus of 25 and 31 weeks are represented in medial and lateral views and in projection outline of the basal surface in the above figures.

The differences in the external form of the right lung in the earlier and later stage are of the same character as on the left side, but less pronounced. The right lung of the earlier fœtus is less elongated than the left lung of the same preparation, the greatest sagittal and vertical diameters being more nearly equal.

The pointed apical portion of the earlier stages (Figs. I and II) is, however, again replaced by the more quadrangular form in the older lung (Figs. VII and VIII), due to the sagittal expansion of the upper lobe. The first part of the posterior margin, which inclines obliquely backward and downward in the younger specimen, is directed almost horizontally in the older lung, bringing the apex more into direct continuation with the anterior margin. Later, at term, the expansion of the upper and anterior segment of the superior lobe restores the apex to its position as the upper rounded termination of the posterior margin (Figs. XIX, XX, XXI, XXII). Between the apex proper and the beginning of the vertical portion of the anterior margin, a superior marginal portion passes forward with but a very slight downward inclination (Figs. XIX to XXII). At times, apparently after pulmonary respiration has been inaugurated, the beginning of the vertical portion of the anterior margin is marked on the mesal aspect by a prominent rounded tubercle, which imparts to the superior segment of the marginal portion, between it and the apex, a slight concavity upwards (Fig. XXIII, above 3).

A number of variations are presented in the arrangement of the interlobar fissures of the right lung.

* C. Gegenbauer, Lehrb. d. Anat. d. Menschen, 1890, Bd. ii., p. 104.

a. Sternocostal surface.

(1) The typical form, which corresponds to the usual adult condition, is represented on the sternocostal surface by Fig. VII. The intermediate fissure leaves the main interlobar incisure at an acute angle and passes forward over the sternocostal surface to the anterior margin, its direction being nearly parallel to the course of the anterior part of the inferior margin. The outline of the sternocostal surface of the middle lobe is nearly that of a parallelogram.

(2) In a second form, the middle portion of the intermediate fissure is obliterated, partially or completely (Figs. XVIII and XIX), the fissure developing only at its point of departure from the main interlobar incisure, and again a short distance from the anterior margin.

(3) A third type is presented by the extension of the intermediate fissure dorsad of the main incisure (Fig. XXI). At times this is combined with island formation at the anterior extremity (Fig. II).

b. Mediastinal surface.

The return of the main interlobar incisure of the right lung across the lower portion of the mediastinal surface again presents variations which are similar to those encountered on the left side.

The usual arrangement is indicated in Figs. VIII, XX, XXII, and XXIII. The termination of the fissure meets, or nearly meets, the anterior inferior margin of the hilus, defining the anterior border of an irregularly quadrangular field for apposition to the inferior vena cava (XX, XXII, XXIII, 1). More exceptionally (Fig. I) the fissure returns on the mediastinal surface to the inferior angle of the hilus, nearly excluding the inferior lobe from participation in the composition of the mediastinal surface.

The intermediate fissure usually appears reduced on the mediastinal surface, rarely reaching as far as the anterior border of the hilus.

Figs. I, XX, and XXIII exhibit instances of this limitation of the mediastinal portion of the intermediate fissure. Figs. VIII and XXII afford examples of the more extensive development of this fissure on the mediastinal surface. The beginning of the main interlobar incisure at times traverses the azygos groove (Figs. I and XX), beginning at the upper posterior border of the hilus. The entire posterior segment of the fissure is complete, travelling backward over the costovertebral surface. In other instances the incisure, beginning at the same point, is obliterated in the segment crossing the costovertebral surface (Figs. VIII, XXIII). In other cases the region of the azygos groove is not fissured, the incisure first appearing on the costovertebral surface (Fig. XXII).

c. Phrenic or basal surface.

The greater area, compared with the left side, which the phrenic surface of the right lung presents, is seen, by reference to Figs. V, XI, and XIII, to be mainly due to the greater basal surface of the right middle, as compared with the upper left lobe.

In the earlier stages (V and VI) the basal interlobar incisure passes on both sides obliquely backward and inward toward the medial margin of

the phrenic surface. In the older lungs (XI, XII, and XIII) the direction of the incisure both in right and left lung is more nearly transverse.

On the right side the incisure meets the mediastinal border of the phrenic surface a short distance behind the centre. This change in direction is evidently due to the greater area of contact in the later stages between the postero-internal portion of the right lung and the intrathoracic segment of the inferior vena cava.

Azygos lobe and fissure.

At times the median and posterior portion of the phrenic surface is more or less completely separated from the rest of the inferior lobe by a fissure or set of fissures defining a portion of the lung which corresponds in position and relation to the inferior cava to the infracardiac or azygos lobe of lower mammalia.

Fig. XXV, 1, presents a simple form of this fissure and rudimentary lobe.

In the lung represented in Fig. XXIV a more complex arrangement of this structure exists.

The posterior segment of the fissure—beyond 2—is incomplete, although it can be traced backwards and inwards beneath the investing visceral pleura.

In all cases the anterior portion of the azygos lobe passes forward, forming a blunt, tongue-shaped marginal process (Fig. XXIV, 1) which at times projects some distance beyond the internal portion of the main interlobar incisure, resting in contact with the basal surface of the middle lobe.

(The fœtus *D* and *G*, from which Figs. XXIV and XXV are taken, were twins, both female.)

D. *Attachment of Broad Pulmonary Ligament.*

1. *Right Lung* (Figs. I, VIII, XX, XXII, XXIII, 8).

The pleural fold is attached to the "lower œsophageal area" (*vide infra*) of the mediastinal surface, crossing the same usually somewhat obliquely from the lower angle of the hilus downward and backward.

The sharp, somewhat projecting ridge just anterior to the pulmonary attachment of the fold fits into the angular recess between œsophagus and vena cava.

2. *Left Lung* (Figs. III, X, XV, XVII, 1).

The pulmonary attachment of the fold descends from the lower angle of the hilus, usually just posterior to the œsophageal surface of the œsophageal tuberosity.

The broad pulmonary ligament is formed by a right and left pleural fold, passing between the posterior inferior portion of the mediastinal lung surface, below the hilus and the adjacent surface of the œsophagus. The arrangement of the folds is schematically indicated in Fig. XXXIV, representing a thoracic transection below the region of the hilus.

E. *Arrangement of Main Structures at Hilus.*

1. *Left Lung.*

The typical condition is seen in Fig. XXVII, 12–15.

The section of the structures has been made just before they enter the lung.

The left pulmonary artery (12) occupies the highest position. The section has passed through the vessel at the point where the apical branches for the supply of the superior portion of the upper lobe are given off, the two superior extensions of the lumen seen in the cross cut indicating these vessels. The superior left pulmonary vein (13) lies in front. Immediately behind this vessel, and below the pulmonary artery, the left bronchus appears in section immediately beyond the primary division.

The left inferior pulmonary vein (15) occupies the lowest and most posterior position.

Fig. XXVI shows the same structures divided a little nearer to the lung.

The main pulmonary artery (11) appears above and behind, the superior pulmonary vein (10) above and in front, already divided into two main branches.

Between 10 and 11, and crossed by the forking of the former line, are seen the openings of the two apical branches of the pulmonary artery supplying the upper lobe.

12 and 13 are the two primary bronchial trunks, and the inferior branch of the left pulmonary vein again occupies the inferior posterior angle of the hilus.

2. *Right Lung.*

In Fig. XXX the right bronchus is cut after the division into the eparterial (17) and hyparterial trunks (20).

The apical branches of the right pulmonary artery, supplying the upper lobe (18, 19), appear in front and below the eparterial bronchus. Above the latter, between it and the azygos, appears the apical pulmonary vein (not numbered in the figure).

The main trunk of the pulmonary artery (22) is in this section still quite in front of the hyparterial bronchus.

On the same level, constituting the most anterior structure, appears the section of the upper right pulmonary vein (21), while the inferior pulmonary vein (23) is seen below and behind the hyparterial bronchus.

In Fig. XXVIII the same arrangement of the structures is found, the main pulmonary artery occupying the position between the hyparterial bronchus and right superior pulmonary vein.

In Fig. XXIX the bronchus is cut just at the point of division into eparterial and hyparterial trunks (11). The main pulmonary artery lies in front, applied to the anterior and inferior border of the bronchial cross cut. The apical pulmonary arteries (9, 10) are already given off, and lie in front of the upper (eparterial) portion of the bronchial section.

The upper and lower pulmonary veins occupy the usual position at the anterior and inferior portion of the hilus region.

The sections demonstrate well the early derivation and separate anterior course of the apical pulmonary arterial branches and the position of the main arterial trunk prior to the intersection with the bronchial fork.

II. Topography of Mediastinum and Mediastinal Surface of Lung.

As previously stated, the formaline-hardened lung admits of removal from the thorax without impairing the natural form of the organ. The mediastinal surface of the lung carries with it impressions which correspond to the relations with the mediastinal contents, and which afford a means of determining accurately the extent of such relations. In the following, certain portions of the mediastinal lung surface will be described as being "in contact" with certain structures contained in the mediastinal space. It will, of course, be understood that the mediastinal parietal pleura intervenes. In the same way, to avoid circumlocution, such terms as "œsophageal" or "tracheal" "surface" or "area" will be employed, in describing certain regions of the mediastinal lung surface. Here, again, the interposition of the parietal pleura is assumed without further specification.

1. *Topography of Mediastinal Contents. Right Side.*

In Fig. XXVIII (fœtus at term, *E*) the right lateral view of the mediastinal contents is given, after removal of the lung by division of the structures entering and leaving the viscus at the hilus, the parietal pleura remaining in place. In Fig. XXIX (fœtus at term, *D*) the same structures are shown, with the upper portion of the mediastinal pleura reflected. In Fig. XXX (infant, immediately after birth, *F*) the mediastinal contents, hardened *in situ*, are removed from the thorax and viewed from the right side and behind.

These structures, thus built together and invested by the mediastinal pleura, form the bed upon which the mediastinal surface of the right lung rests. The elevations and depressions of this portion of the parietal pleura, caused by the more marked projection of certain of these structures into the right pleural sac, produce a corresponding modelling of the internal surface of the lung. We will see that the plastic lung substance adapts itself to the opposed mediastinal pleural surface, and takes, so to speak, a negative cast of the inequalities of this surface. The appearance, therefore, of the mediastinal surface of the lung will best be appreciated by first considering the arrangement of the mediastinal contents which produce this appearance.

In Fig. XXVIII the anterior portion of the right sternocostal pleura is seen to be reflected to form the mediastinal leaf, along a curved line, convex forward, which descends from behind the right sternoclavicular articulation, over the anterior surface of the thymus gland and the pericardium. These two structures form together the contents of the anterior and larger division of the mediastinal space.

The lateral surface of the thymus (Fig. XXVIII, 9, Fig. XXIX, 8) constitutes approximately the upper third, the pericardium the lower two-thirds of the area in vertical measurement. In the sagittal direction the area increases steadily from the sharp point with which the lateral surface of the thymus begins to appear in the right mediastinal wall above, to

the broad antero-posterior extent of the right margin of the pericardium at its attachment to the diaphragm below. The lateral surface of the thymus, invested thus by the anterior and upper part of the mediastinal pleura, is plane, or even slightly concave. Between it and the prominent right lateral surface of the pericardium a furrow running obliquely downward and forward receives the ridge which, on the mediastinal surface of the right lung, separates the thymic from the concave pericardial area (Fig. XXX, between 2 and 3).

Behind the thymic area the prominent lateral surface of the right innominate vein and superior vena cava is seen (Figs. XXVIII, 10, XXIX, continuation downwards of 3, XXX, 15). In the fœtus the portion of the right innominate vein in contact with the mediastinal pleura is comparatively short, inclined obliquely across the upper apical portion, whereas the superior cava appears relatively long, directed more vertically downwards, dorsal to the thymus and upper right portion of the pericardium.

The right phrenic nerve descends between the superior cava and the thymus, and lower down crosses the pericardium in front of the structures connected with the pulmonary hilus, to continue along the anterior and lateral circumference of the inferior vena cava to the diaphragm (Figs. XXVIII, 8, XXX, 16).

The posterior portion of the mediastinal space is occupied in its middle third by the structures connected with the lung at the hilus, and already considered in detail in reference to their mutual relations.

Immediately above the upper margin of the hilus region the azygos vein arches from behind forward to join the superior cava (Figs. XXVIII, 2, XXIX, 1, XXX, 4).

Between the innominate and superior caval veins in front, the vertebral column behind, the apex of the pleural sac above, and the azygos arch below, the right mediastinal pleura covers a field (Fig. XXVIII, 1) which, after reflection of the membrane (Figs. XXIX and XXX), is seen to contain the following structures: The right lateral wall of the trachea occupies the central portion of this area (Figs. XXIX, 6, XXX, continuation of 3). The tube is separated from the large venous trunks in front by a quantity of fatty connective tissue and small lymphatic glands (Figs. XXIX, 7, XXX, 13), and is crossed obliquely in the direction from above and in front downward and backward by the right vagus (Figs. XXIX, 5, XXX, 4).

Behind the trachea, between it and the vertebral column, the right lateral portion of the œsophagus appears (Figs. XXIX, 4, XXX, continuation of 1).

At the level of the upper border of the hilus the œsophagus encounters the arch of the azygos vein. The vein is rendered very prominent at this point by the underlying œsophagus, and projects strongly into the right pleural sac. Dorsal to the region of the hilus the vein gradually becomes less prominent, and recedes toward the median line. The right lateral surface of the œsophagus again appears below the arch, between the vertical azygos vein behind and the pericardium and structures at the hilus in front.

The œsophageal surface in contact with the right mediastinal pleura gradually increases as the vein recedes. At the beginning of the lower third of the space the œsophagus has entirely replaced the vein in relation to the pleural leaf. In this situation the inferior œsophageal branches of the vagus are seen shining through the investing pleura (Fig. XXVIII, 4).

Below the hilus and in front of the œsophagus is the prominent posterior and lateral wall of the intrathoracic segment of the inferior cava (Figs. XXVIII, 19, XXX, 24).

Behind the œsophagus and azygos, covered by the costovertebral pleura, are seen the intercostal vessels, and more laterally the longitudinal strand of the sympathetic nerve.

2. *Mediastinal Surface of Right Lung* (Figs. XX, XXII, XXIIa, XXIII).

Boundaries:

In front: anterior sharp margin.

Below: mediastino-phrenic margin.

Behind: internal margin.

This surface of the lung is modelled on the mediastinal pleura covering the contents of the space, as above detailed, and accordingly presents a natural division into three fields of unequal extent and conformation.

(1) *Region in Front of Hilus.*

a. Thymic area.—The upper third is formed by a smooth, slightly convex surface in apposition with the parietal pleura covering the lateral surface of the thymus gland (*thymic area*) (Figs. XX, XXII, XXIII, 3), and moulded over the form of this organ. The thymic area occupies the upper half of the medial surface of the upper lobe.

b. Pericardial area.—The lower two-thirds of the anterior region include nearly equal portions of the upper and middle lobes, forming a concave surface (*pericardial area*) moulded over the prominence of the pericardium (Figs. XX, XXII, XXIII, 2). This area extends backward to the anterior margin of the hilus, and presents immediately in front of the latter a narrow, linear, nearly vertical furrow, resulting from its relation to the right phrenic nerve.

The pericardial area is separated from the thymic surface by a moderately prominent blunt ridge, which corresponds to the furrow between the lateral surface of the thymus and the pericardium.

(2) *Region of Hilus.*

a. Hilus.—Irregularly oval, with longest diameter in the long axis of the lung. The posterior border is nearly vertical; the anterior, convex. The upper extremity is blunt, quadrangular; the lower extremity pointed.

The arrangement of the chief structures entering and leaving the lung at the hilus has been described above in detail.

b. Surface above hilus presents in front a sharply defined vertical groove for the reception of the lateral surface of the right innominate and superior caval veins. (Figs. XX, XXII, XXIII, 4). The posterior border of this groove, immediately above the hilus, is interrupted by the junction of the caval depression with the deep groove lodging the terminal

part of the azygos vein (Figs. XX, XXII, XXIII, 6). The latter curves from behind forward, following closely the superior margin of the hilus.

Anteriorly the caval impression is prolonged down to nearly the middle of the anterior margin of the hilus, forming by its anterior margin the posterior boundary of the thymic area.

Behind the caval impression is a smooth quadrangular field (Figs. XX, XXII, XXIII, 5) in contact with the parietal pleura, which here covers smoothly the right lateral surface of the trachea, the peritracheal lymphatic and fatty connective tissue, and the right vagus, which crosses this segment of the trachea obliquely from above and in front downwards and backwards.

c. Surface below hilus.—A rectangular portion of the inferior lobe, deeply concave, surrounds the lateral aspect of the inferior cava (Figs. XX, XXII, XXIII, 1).

This caval surface is bounded above by the inferior margin of the hilus, in front by the prolongation of the main interlobar incisure from the phrenic surface upward and backward upon the mediastinal surface to the lower part of the anterior border of the hilus. Behind, the caval area is limited by a prominent vertical ridge of lung tissue, which fits into the deep angular interval between the œsophagus and the vena cava, and which carries along its dorsal margin the attachment of the broad pulmonary ligament.

(3) *Region behind Hilus.*

This region is occupied by a narrow, vertical field, enlarging somewhat below, which separates the mediastinal from the costovertebral surface, and which is in relation with the œsophagus and the proximal portion of the azygos vein, both structures which produce more or less well marked grooves on this portion of the lung surface.

Above the level of the upper border of the hilus, from the region of the apex down, a narrow, vertical area, situated dorsal to the smooth tracheal surface, is in contact with the mediastinal pleura covering the upper thoracic portion of the œsophagus. This area is separated from the costovertebral surface by a prominent, well-defined, sharp margin, passing into the apical region above, and continuous below with the posterior border of the azygos groove. This margin (Figs. XX, XXII, and XXIII, behind 5) fits into the angle between the upper portion of the œsophagus and the vertebral column.

At the level of the upper border of the hilus the sharply defined curved groove caused by the arch of the azygos vein turns downward, dorsal to the hilus (Figs. XX, XXII, XXIII, 6). In the beginning of its vertical course the groove is well marked. In some lungs a faint impression crosses the upper part of the costovertebral surface obliquely, to join the azygos groove. This second impression is caused by the superior intercostal vein.

Below, the azygos groove gradually becomes less distinct, and merges into a somewhat broader surface, which lies between the posterior margin of the hilus and the costovertebral surface. Reference to the structures

left *in situ* in the posterior part of the mediastinum after removal of the right lung explains this appearance (Figs. XXVIII, XXX). The azygos vein, ascending in the mediastinum, occupies in main a nearly medial position, only beginning to deviate markedly to the right on reaching the level of the sixth thoracic vertebra. Above this point the vein comes into close contact with the right mediastinal pleura and impresses the mediastinal surface of the lung behind the hilus, as indicated. Below this point the vein gradually recedes from the mediastinal pleura, and, on reflecting the membrane, the right lateral margin of the œsophagus begins to appear between the posterior margin of the hilus and vein. This œsophageal area begins above as a narrow pointed surface which expands in descending, until in its lower portion it equals the inferior vena cava in sagittal measure. With the parts undisturbed and in their natural condition, the gradual recession of the azygos vein from contact with the right mediastinal pleura, and its replacement in relation to the membrane by the right border of the œsophagus, is affected without producing any abrupt line of demarcation. Consequently, in the hardened lung removed from the thorax, the azygos groove, sharp and well defined above, gradually fades out below the middle of the hilus, and is replaced by the broader, smooth surface in contact with the mediastinal pleura investing the œsophagus (Figs. XX, XXII, XXIII, 7).

The entire region of the mediastinal lung surface dorsal to the hilus is, therefore, composed of an upper narrower and lower wider œsophageal area, separated from each other by the surface in contact with the azygos vein. The latter structure is rendered prominent in the upper mediastinal region by its course upward, forward, and to the right, and by the underlying œsophagus. Below the middle of the hilus, on the other hand, the vein gradually recedes from the mediastinal pleura and lies nearer the median line, being enabled to assume this position by passing behind the œsophagus, the latter tube gradually inclining forward, and ceasing its close apposition to the anterior surface of the vertebral column.

The relative extent of these areas of relation of the mediastinal lung surface with the contents of the mediastinum is shown schematically in Fig. XXIIa.

3. *Topography of Mediastinal Contents. Left Side.*

Fig. XXVI shows the mediastinal contents *in situ* covered by the pleura in a fœtus at term (*D*), and Fig. XXVII shows the same structures removed from the thorax, with the pleura partially reflected, in the infant immediately after birth (*F*).

In front, as on the right side, the lateral surface of the thymus gland (XXVI, 5, XXVII, 4) appears above, the prominent pericardium (XXVI, 7) below, the latter crossed obliquely by the left phrenic nerve (XXVI, 6, XXVII, 5). At the upper and posterior margin of the left pulmonary root, the arch of the aorta produces a marked elevation of the mediastinal pleura, which is continued along the entire posterior border of the mediastinum by the thoracic aorta, the elevation becoming gradually less marked as the vessel approaches the diaphragm (XXVI, 15, XXVII, 16).

Above the level of the upper hilus margin, between the vertebral column behind and the thymus gland in front, the mediastinal pleura covers the following structures:

1. Immediately in front of the vertebral column the left margin of the œsophagus (XXVI, 7).

2. The intrathoracic segment of the left subclavian artery, forming a prominent rounded ridge in the mediastinal wall (XXVI, 8, XXVII, 6).

3. In front of the subclavian elevation the mediastinal pleura covers smoothly a field (presubclavian) (Fig. XXVI, 4) in which are placed the left common carotid artery (XXVII, 8), the left vagus (XXVII, 9), and a quantity of fatty and lymphatic tissue (XXVII, 3) which lies behind the thymus and left innominate vein.

The latter structure appears in the upper and anterior angle of this surface behind the thymus (XXVII, continuation downward of 1), and frequently receives the left superior intercostal vein (Fig. XXVI, 9, XXVII, 11), which passes upward and forward from below and behind, crossing the aortic arch and pneumogastric nerve, the nerve being placed between the arch and the vein.

The internal mammary artery (XXVII, 2) crosses the upper angle of the lateral thymus surface and the innominate vein (XXVII, 2), and the upper part of the intrathoracic segment of the left phrenic nerve descends behind the innominate vein, crossing usually over the point of entrance into the latter of the superior intercostal vein.

Below the hilus the pericardium projects decidedly into the left pleural compartment. This is especially marked along the posterior inferior segment, where the pericardium covers the prominent posterior part of the left thick ventricular margin and the adjoining posterior and inferior part of the left auricle.

Between the elevation of the posterior part of the left mediastinal leaf produced by the thoracic aorta behind (XXI, 15, XXVII, 16), the diaphragm below, the portion of the pericardium referred to in front and above, with the entrance of the left inferior pulmonary vein as its upper limit (XXVII, 15), the left pleural cavity exhibits a deep triangular recess, bounded internally by the pleura covering the left side of the lower thoracic segment of the œsophagus. One-half of the circumference of the œsophagus appears thus in the inner wall of this recess, after the tube has passed the posterior surface of the left auricle, in the interval between aorta behind, pericardium in front, and diaphragm below (XXVI, 16, XXVII, 18).

4. *Mediastinal Surface of Left Lung.*

This surface corresponds to the structures above described, and is modelled accordingly (Figs. XV, XVII, XVIIa). The lower and longer part is occupied by the deep and well-marked impression for the left side of the pericardium (XV, XVII, 7). The greater portion of this pericardial surface is formed by the medial surface of the upper lobe. A portion of the inferior lobe contributes a smaller pericardial surface to be presently considered in detail.

Immediately above the pericardial area the medial surface of the left lung rests on the mediastinal pleura covering the left lateral surface of the thymus gland. This thymic surface (XV, XVII, 6) in the hardened lung is plane or slightly convex, and is separated from the pericardial depression immediately below by a raised curved margin, with the concavity directed downward and backward, which corresponds to the curved groove separating the thymus *in situ* from the pericardium. In well-hardened lungs a faint linear impression descending obliquely along the posterior margin of the thymic area is due to the left phrenic nerve.

Above the hilus the medial surface of the lung is grooved by the arch of the aorta (XV, XVII, 3). This groove begins as a faint depression which rapidly deepens until it obtains its greatest development just above and behind the superior posterior angle of the hilus. At this point a narrower, deep, nearly vertical groove passes upward to the upper margin of the lung, produced by the intrathoracic segment of the left subclavian artery.

Between the subclavian groove behind, the upper border of the aortic furrow below, the upper lung margin above, and the thymic surface in front, the medial aspect of the left lung presents a smooth, nearly plane field (presubclavian area, XV, XVII, 5), which rests on the mediastinal pleura covering the proximal portion of the left common carotid artery and the left vagus, embedded in a quantity of fatty and granular connective tissue.

If the superior intercostal vein is large, a shallow linear impression may be produced by it, intersecting the aortic groove obliquely.

Behind the hilus the aortic groove continues to be marked, descending nearly vertically. It can be followed to the lower border of the lung, growing gradually somewhat shallower.

Below the hilus, and in front of the lower portion of the aortic groove, the medial lung surface presents a well-marked triangular process, which can be called, with regard to its relations, the pericardio-œsophageal tuberosity. It occupies the triangular mediastinal recess above described, between aorta behind and pericardium in front, and containing at the bottom the left wall of the œsophagus.

The pericardio-œsophageal tuberosity is a product of the medial surface of the inferior lobe. It starts just in front of the lowest point of the hilus in form of a ridge (XV, XVII, 2), which gradually becomes more and more elevated in proceeding downward, forward, and inward. The tuberosity thus produced presents three surfaces, two mediastinal and one phrenic. The phrenic surface constitutes the most anterior and medial portion of the area which the inferior lobe contributes to the formation of the basal surface of the left lung (Fig. XIII, 4).

The mediastinal surfaces are an anterior and a posterior. The anterior surface (XV, XVII, 8) is concave, and contributes to the formation of the pericardiac depression.

In some instances the return of the main interlobar incisure to the anterior and inferior border of the hilus on the medial surface of the lung

limits this pericardial surface of the tuberosity above and in front (Fig. XVII).

In other cases the pericardial surface contributed by the inferior lobe is much larger and exceeds the limits of the tuberosity. The interlobar incisure then passes upward and backward more vertically from the anterior part of the mediastino-phrenic border, and reaches the hilus nearly at the middle of its anterior margin (Fig. XV). In such a case the pericardial surface of the tuberosity is continuous with the general pericardial surface of the inferior lobe, constituting the posterior inferior segment of the same.

The posterior, or œsophageal, surface of the tuberosity (XV, XVII, 9) looks backward and inward, and rests upon the pleura covering the portion of the œsophagus which appears between aorta, pericardium, and diaphragm. The surface is triangular, with a broad posterior vertical base. The lateral borders are formed below by the postero-internal part of the sharp mediastino-phrenic margin of the lung, and above and in front by the ridge above described as proceeding from the lower angle of the hilus. This ridge separates the pericardial from the œsophageal surface, and corresponds to the depression between pericardium and œsophagus.

The pericardio-œsophageal tuberosity of the left lung evidently corresponds to the elevated ridge of lung tissue which, on the right side, fits into the narrow interval between œsophagus behind and the inferior vena cava in front.

The attachment of the broad ligament is dorsal to the œsophageal surface of the tuberosity, the layers descending almost vertically from the lower angle of the hilus. At the attachment of the ligament to the lung, or just anterior to this line, a sharp vertical ridge is frequently observed which fits into the depression between aorta and œsophagus.

In well-hardened lungs a vertical linear impression, descending over the costovertebral surface, indicates the relation to the sympathetic strand and the line of the costal capitula.

The relation of the thoracic duct to the mediastinal pleura has not been determined in the above preparations, as the demonstration of the same would produce too much disturbance in the arrangement of the remaining structures.

With this exception the above account is believed to present the main relations of the lungs and mediastinal contents correctly.

III. Thymus Gland.

(Figs. XVIII, XXIV, XXVI, XXVII, XXVIII, XXXI, XXXII, XXXIII.)

The gland, situated partly within the thorax, partly in the anterior cervical region, is placed in front of the pericardium and the beginning and termination of the large vessels, accurately adapting itself to the structures with which it comes into contact.

The thoracic portion presents in the gland hardened *in situ* five distinct surfaces, as follows:

Anterior, mediastinal.

Two lateral, pleural.

Posterior, vascular.

Inferior, pericardiac.

The arrangement of the surfaces is well seen in the view of the gland *in situ* from the side, as in Fig. XXVIII. The anterior or mediastinal surface is directed upward and forward in the upper, more directly forward in the lower, part. Viewed from in front (Figs. XVIII, 1, XXXI, 10) this surface is seen to be triangular, with the apex directed downward. Above, the base is continuous with the anterior surface of the cervical portion (XVIII, 5, XXXI, 7). The sides are bounded by the sternocostal-mediastinal reflections of the right and left parietal pleura (XXXI, 3, 11), which pass from the sternum directly backward, to invest the lateral surfaces of the gland.

The inferior surface looks backward and downward, and rests on the upper and anterior portion of the pericardium.

The lateral surfaces (XXVII, 4, XXVIII, 9), invested by the anterior portion of the mediastinal pleura, look directly outward, and are in relation with the thymic area on the medial surface of each lung.

The phrenic nerve descends on each side, near the posterior border of the lateral surface (XXVIII, 8, XXVII, 5). On the right side this posterior border rests on the right innominate vein and the superior cava (XXVIII, 10). On the left side the posterior limit of the lateral surface is formed above, for a short distance, by the left innominate vein; below, by some fatty and lymphatic gland tissue lying between the vein, the trachea, and the left common carotid artery (XXVII, 3). The upper angle of this surface is crossed from behind forward by the left internal mammary artery (XXVII, 2).

The greatest interest attaches to the posterior surface and to the relations of the gland to the large venous trunks in the upper and anterior portion of the mediastinum.

In the typical arrangement the left innominate vein is situated entirely behind the gland. Fig. XXXI shows the aberrant course of the vein in front of the gland. This arrangement was first observed by Astley Cooper in 1832.* Wenzel Gruber† in 1876 reported two additional cases. The same author‡ observed seven cases in which the vein passed through the substance of the gland.

The prethymic position of the left innominate vein is, therefore, an extremely exceptional one. In the case observed by us (Fig. XXXI, 9) the vein traversed the upper portion of the mediastinum immediately behind the manubrium, imbedded in a deep groove on the anterior surface of the thymus, separating the cervical (7) from the thoracic portion of the

* The Anatomy of the Thymus Gland. London, 1832.

† Virchow's Archiv, Bd. 66, 1876, p. 462: "Anatomische Notizen, No. lii."

‡ Beobacht. a. d. Menschl. u. Vergl. Anat., I. Heft, p. 41. Berlin, 1879.

gland (10). Fig. XXVII presents the right lateral view of the same fœtus, showing the relation of the vein (7) to the two portions of the gland.

Figs. XVIII, 1, 6, XXVI, 1, 5, XXIX, 8, show the anterior and the left and right lateral views of the thymus in a fœtus at term (*D*), and Fig. XXXII shows the mediastinal contents of the same individual seen from above, with the thymus partly detached and turned downward and forward. The posterior surface of the gland is seen to rest on the pericardium (13) covering the right auricular appendix (14), the ascending aorta (11) and the pulmonary artery (12). On the right side the anterior surface of the superior cava is in contact with the gland.

The upper and anterior portion of the gland is prolonged into the neck in form of an assymmetrical superior cornu (XVIII, 5, XXVI, 1) which lies in front of the left innominate vein (superior prevenous cornu). On turning this portion of the gland downward and forward (XXXII) a second upper process (superior retrovenous cornu, XXXII, 10) is seen to pass up behind the vein, lying between it and the large arteries at the root of the neck. This case, therefore, is an additional instance of partial retrovenous position of the gland.

The earlier stages of development of the thymus show very clearly how this position is acquired. Fig. XXXIII shows the anterior view of the thoracic contents in a fœtus (*H*) of the latter part of the fourth month. The left innominate vein (1) passes in a groove along the upper border of the thymus gland. The cervical portion of the gland has not yet developed, but is indicated by the slightly more prominent anterior margin of the groove containing the vein. By the further growth of this portion of the gland the upper segment of the thymus attains its usual position in front of the vein.

If the posterior border of the groove develops at the same time, the retrovenous process (XXXII, 10) results; and if this border gives rise to the entire upper segment of the gland, the innominate vein will course in front of the same, at the junction of the thoracic and cervical portions.

The cervical portion is very variously modified by the different form and size of the upper processes and cornua, which frequently reach to the lower border of the thyroid gland.

In the usual arrangement, the more flattened cervical portion is separated when hardened *in situ* from the prismatic thoracic portion by a constriction or neck produced on each side by an oblique groove in which the internal mammary vessels are placed (Fig. XXVII, 2).

Explanation of Figures.

(The letters refer to the individuals, indicating the plates taken from the same fœtus.)

Figs. I to IV. Right and left lungs of fœtus of 25 weeks (estimated) (*A*), medial and lateral surfaces.

1. Pulmonary attachment of broad ligament.
2. Posterior apical costal sulcus.
3. Anterior apical costal sulcus.

Figs. I to IV. Right and left lungs of fœtus of 25 weeks (estimated) (.1). medial and lateral surfaces.

1. Pulmonary attachment of broad ligament.
2. Posterior apical costal sulcus.
3. Anterior apical costal sulcus.
4. Anterior marginal fissure.
5. Secondary fissure of cardiac incisure.

Fig. I.

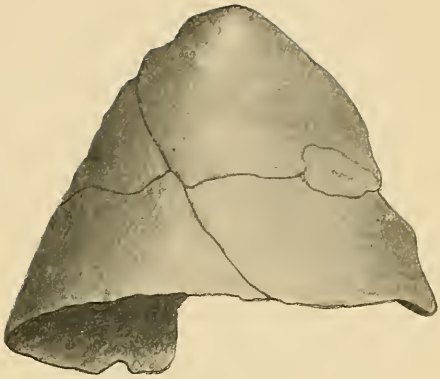


Fig. II.

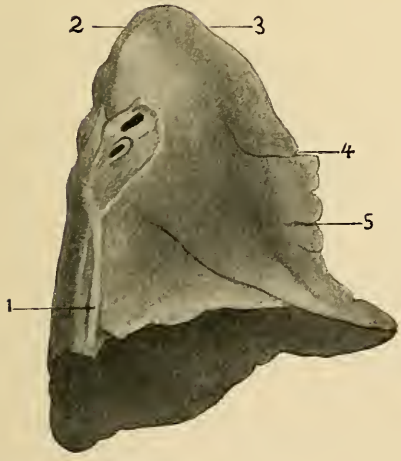


Fig. III.

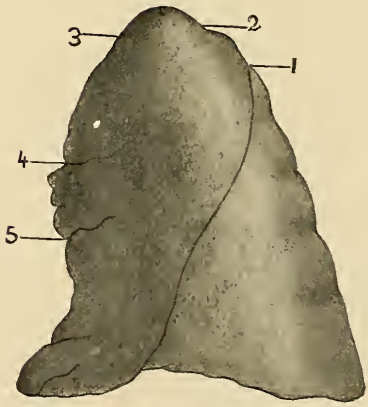


Fig. IV.

Figs. V and VI. Outline representations of the basal surfaces of the same lungs (*A*).

1. Sternocostal surface.
2. Anterior margin.
3. Mediastinal surface.
4. Internal margin.
5. Costovertebral surface.
6. Posterior margin.

Figs. VII to X. Right and left lungs of fœtus of 31 weeks (estimated) (*B*), medial and lateral surfaces.

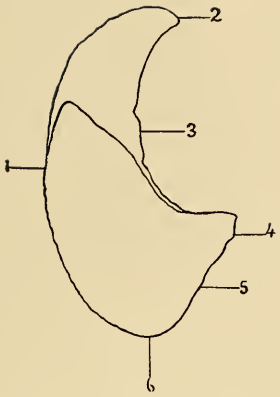


Fig. V.

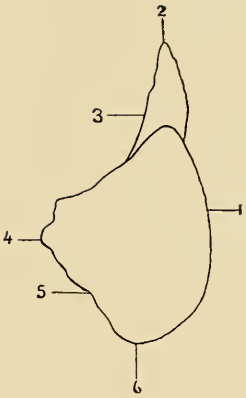


Fig. VI.

Fig. VII.

Fig. VIII.

Figs. VII to X. Right and left lungs of fœtus of 31 weeks (estimated) (*B*), medial and lateral surfaces.

1. Pulmonary attachment of broad ligament.
2. Posterior apical costal sulcus.
3. Anterior apical costal sulcus.
4. Anterior marginal fissure.

Figs. XI and XII. Outline representations of the basal surfaces of the same lungs (*B*).

1. Sternocostal surface.
2. Anterior margin.
3. Mediastinal surface.
4. Internal margin.
5. Costovertebral surface.
6. Posterior margin.

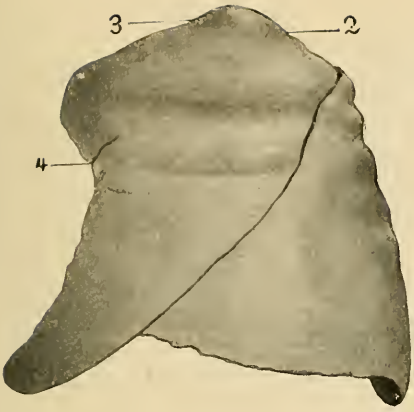


Fig. IX.

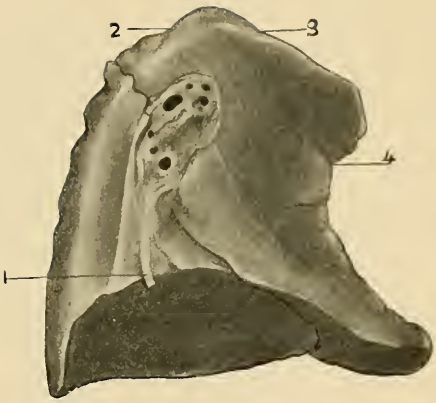


Fig. X.

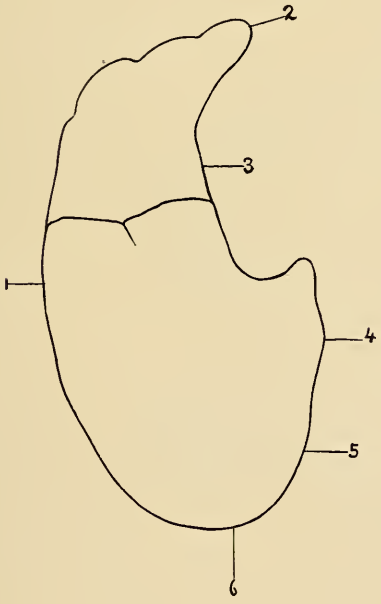


Fig. XI.

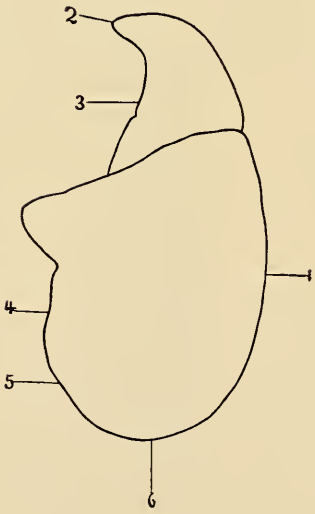


Fig. XII.

Fig. XIII. Fœtus at term (*C*). Basal view of hardened lungs and heart removed together from thorax.

1. Portion of medial margin of phrenic surface in contact with right side of œsophagus.
2. Inferior vena cava.
3. Portion of diaphragm attached to inferior surface of pericardium.
4. Œsophageal tuberosity of left lower lobe, basal surface.
5. Portion of medial margin of phrenic surface in contact with left side of œsophagus.
6. Phrenic margin of aortal surface.

Fig. XIV. Fœtus at term (*D*). Left lung. Sternocostal surface.

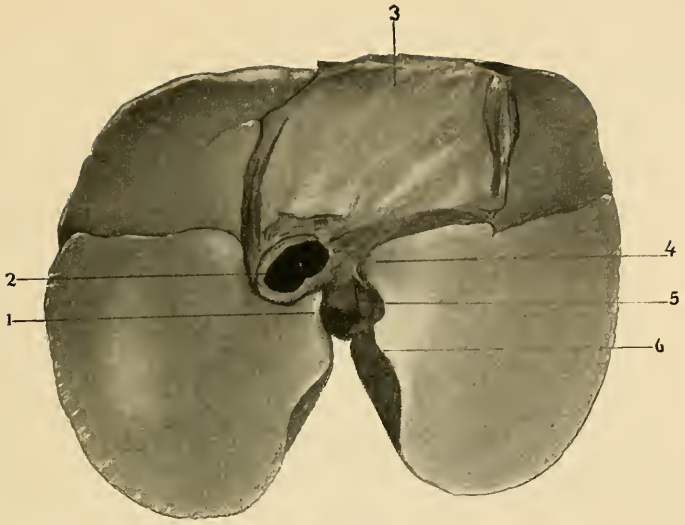


Fig. XIII.

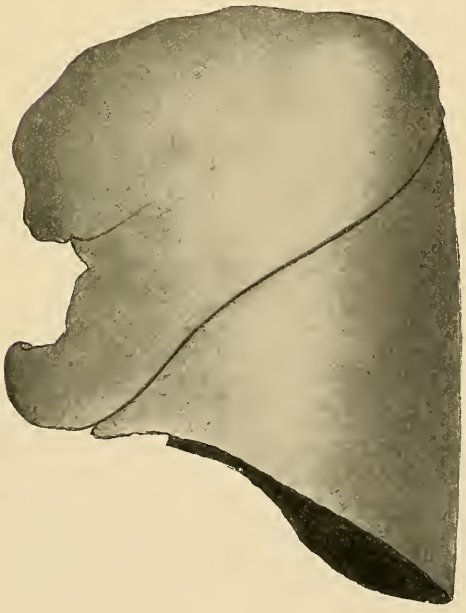


Fig. XIV.

Fig XV. Fœtus at term (*D*). Left lung. Mediastinal surface.
1. Pulmonary attachment of ligamentum latum.
2. Pericardio-œsophageal tuberosity.
3. Aortal groove.
4. Subclavian groove.
5. Presubclavian area.
6. Thymic surface.
7. Pericardial surface.
8. Pericardial surface of pericardio-œsophageal tuberosity.
9. Œsophageal surface of pericardio-œsophageal tuberosity.

Fig. XVI. Fœtus at term (*E*). Left lung. Sternocostal surface.

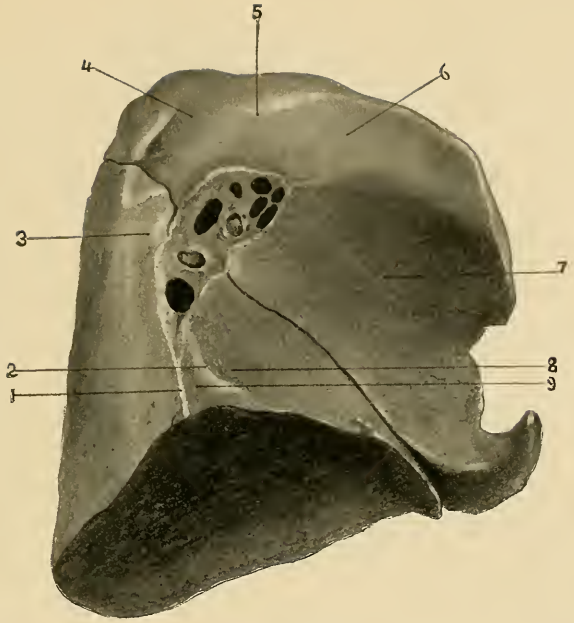


Fig. XV.

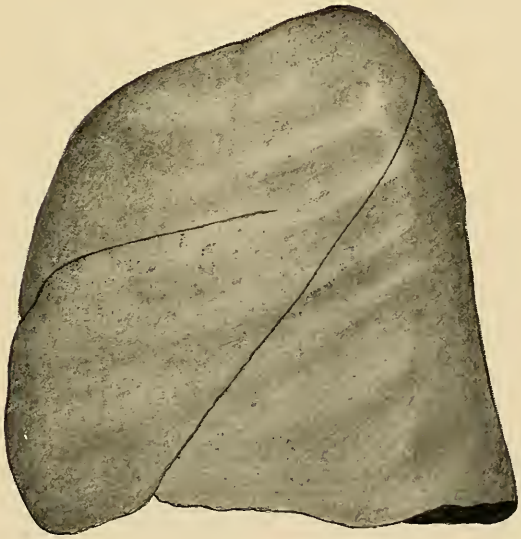


Fig. XVI.

Fig. XVII. Fœtus at term (*E*). Mediastinal surface.

1. Pulmonary attachment of ligamentum latum.
2. Pericardio-œsophageal tuberosity.
3. Aortal groove.
4. Subclavian groove.
5. Presubclavian area.
6. Thymic surface.
7. Pericardial surface.
8. Pericardial surface of pericardio-œsophageal tuberosity.
9. Œsophageal surface of pericardio-œsophageal tuberosity.

Fig. XVIIa. Schematic figure, indicating relations of mediastinal surface of left lung.

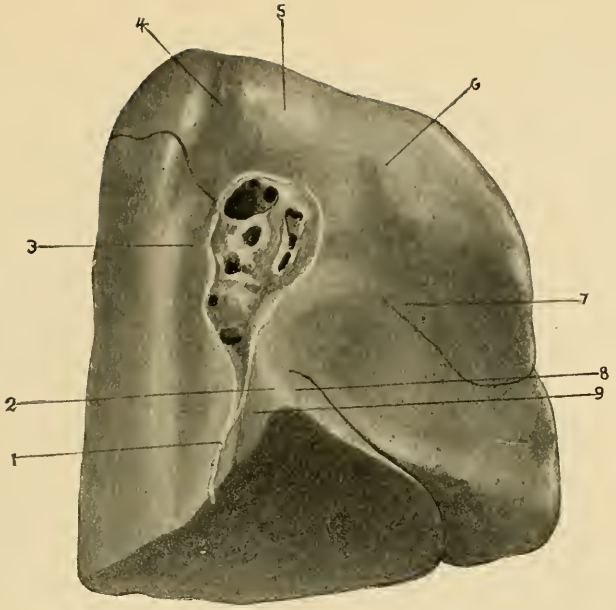


FIG. XVII.

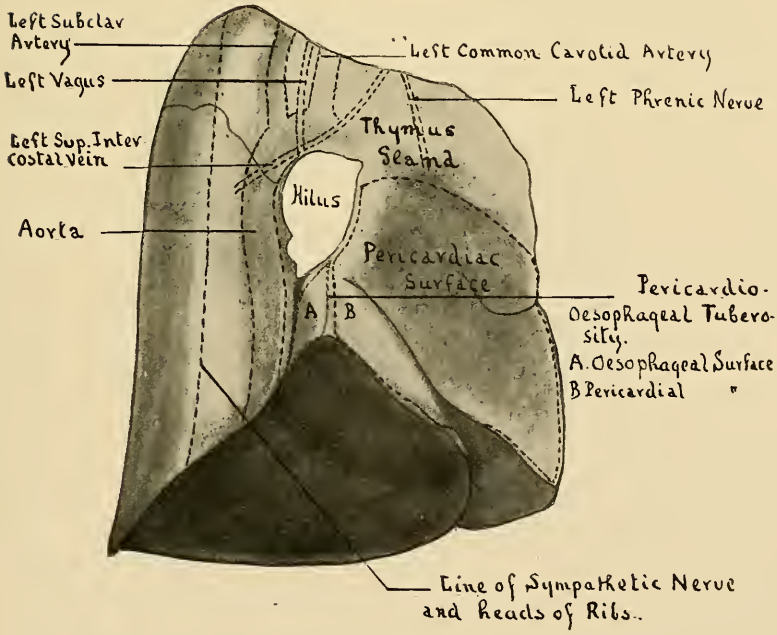


FIG. XVIIa.

Fig. XVIII. Fœtus at term (*D*). Anterior view of lungs and mediastinum *in situ*.

1. Anterior surface of thoracic portion of thymus gland.
2. Junction of right subclavian and internal jugular veins.
3. Right common carotid artery.
4. Inferior thyroid vein.
5. Superior prevenous cornu of thymus gland.
6. Left innominate vein.
7. Left subclavian artery.
8. Parietal pericardium divided by a cruciform incision.

Fig. XIX. Fœtus at term (*D*). Right lung. Sternocostal surface.

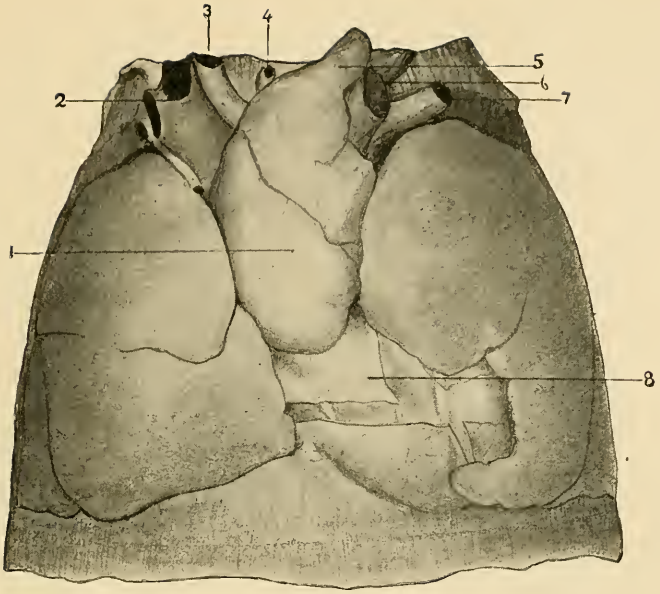


Fig. XVIII.

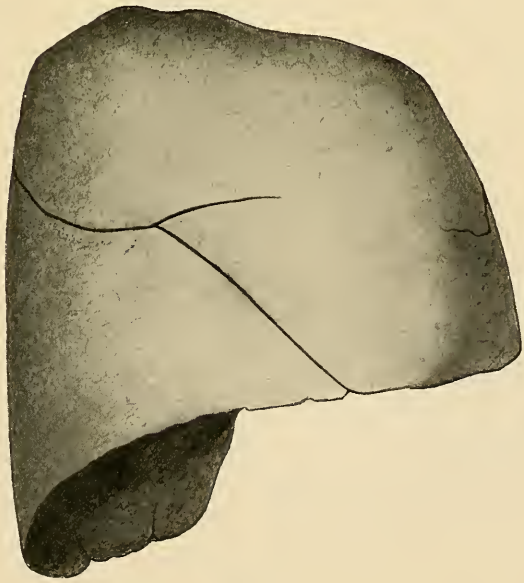


Fig. XIX.

Fig. XX. Fœtus at term (*D*). Right lung. Mediastinal surface.

1. Inferior caval surface.
2. Pericardial surface.
3. Thymic surface.
4. Innominate and superior caval surface.
5. Tracheal and upper œsophageal surface.
6. Azygos groove.
7. Lower œsophageal surface.
8. Pulmonary attachment of ligamentum latum.

Fig. XXI. Fœtus at term (*E*). Right lung. Sternocostal surface.

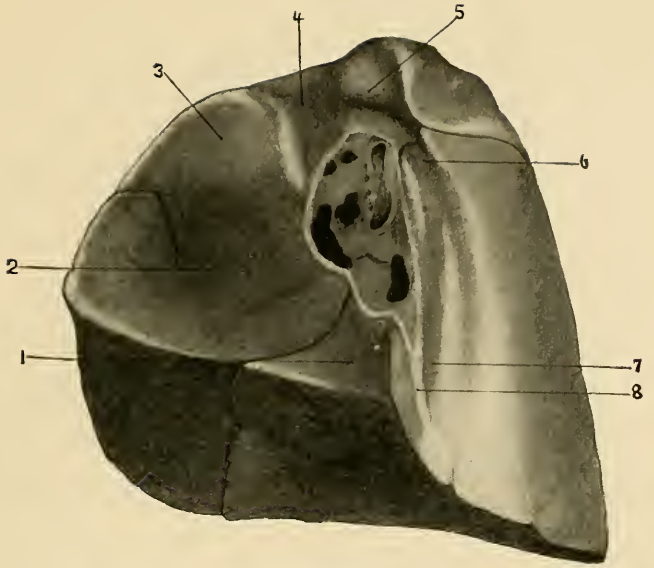


Fig. XX.

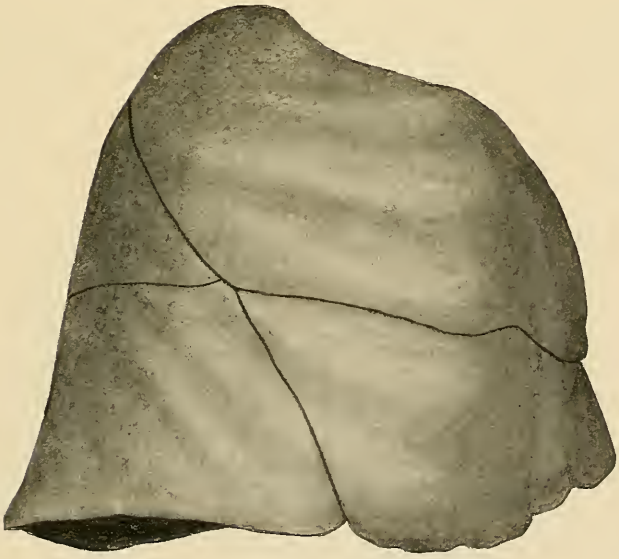


Fig. XXI.

Fig. XXII. Fœtus at term (*E*). Right lung. Mediastinal surface.

1. Inferior caval surface.
2. Pericardial surface.
3. Thymic surface.
4. Innominate and superior caval surface.
5. Tracheal and upper œsophageal surface.
6. Azygos groove.
7. Lower œsophageal surface.
8. Pulmonary attachment of ligamentum latum.

Fig. XXIIa. Schematic figure indicating relations of mediastinal surface of right lung.

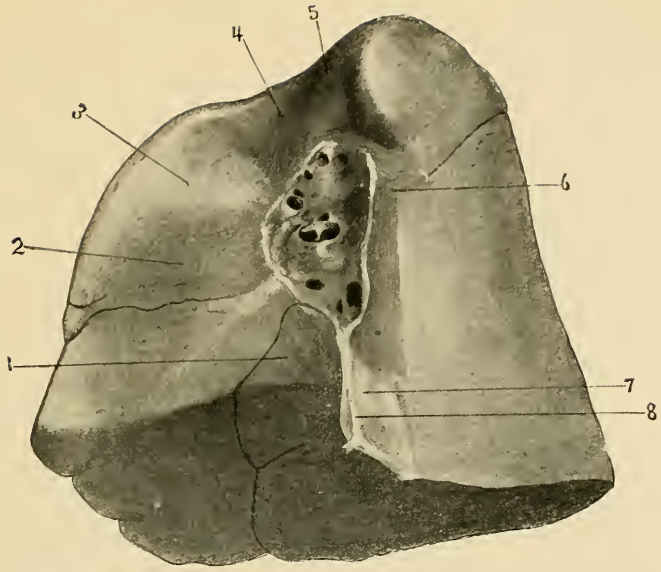


FIG. XXII.

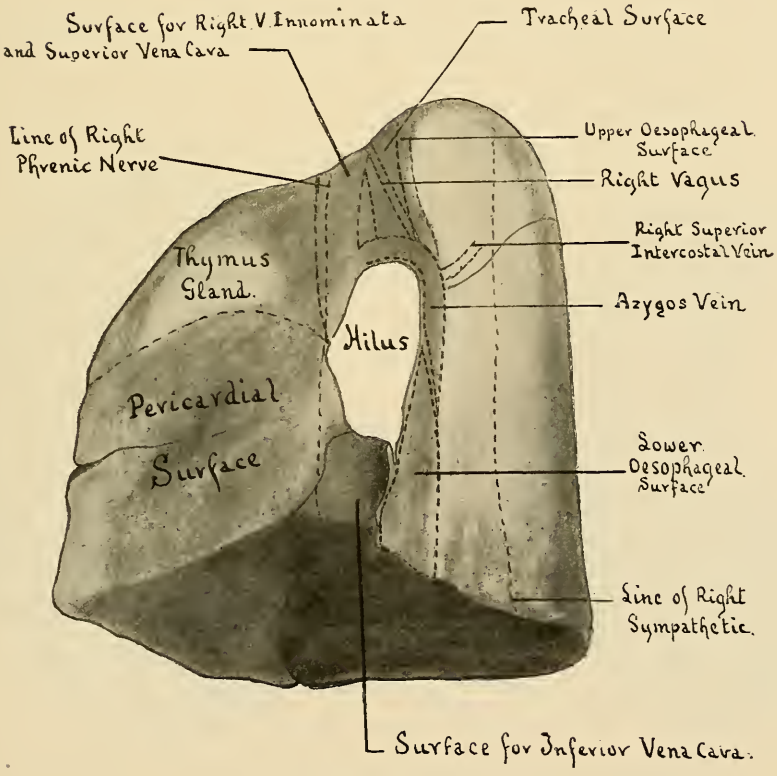


FIG. XXIIa.

Fig. XXIII. Infant, immediately after birth (*F*). Right lung. Mediastinal surface.

1. Inferior caval surface.
2. Pericardial surface.
3. Thymic surface.
4. Innominate and superior caval surface.
5. Tracheal and upper œsophageal surface.
6. Azygos groove.
7. Lower œsophageal surface.
8. Pulmonary attachment of ligamentum latum.

Fig. XXIV. Fœtus at term (*G*). Phrenic surface of right lung, with azygos fissure of lower lobe.

1. Azygos lobule.
2. Azygos fissure.

Fig. XXV. Fœtus at term (*D*). Phrenic surface of right lung, with azygos fissure of lower lobe.

1. Azygos fissure.

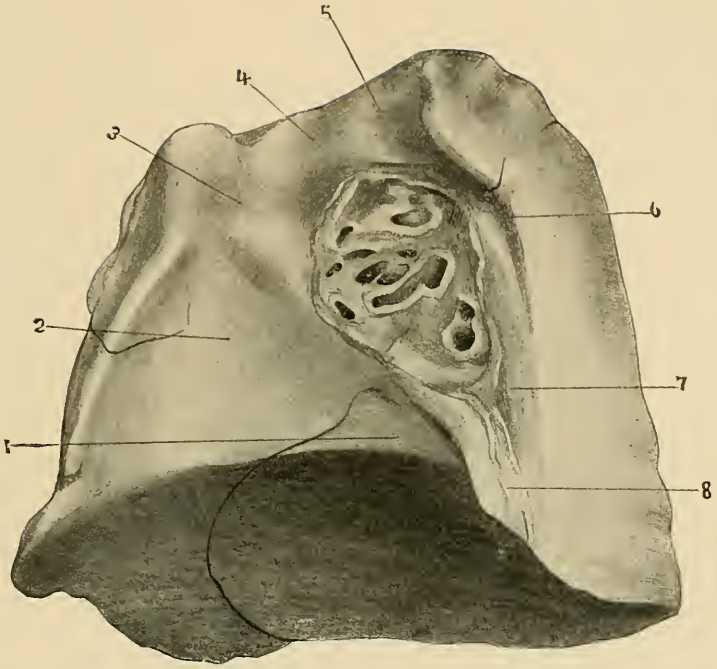


Fig. XXIII.

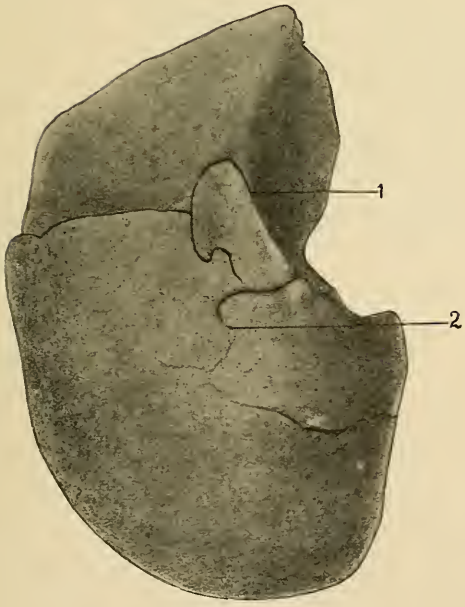


Fig. XXIV.

Fig. XXV.

Fig. XXVI. Fœtus at term (*D*). Mediastinal contents, left lateral view, with parietal pleura in place.

1. Superior prevenous cornu of cervical portion of thymus gland.
2. Left subclavian artery, supracostal portion.
3. Left subclavian vein.
4. Parietal mediastinal presubclavian surface, covering fatty connective and lymphatic tissue overlying left common carotid artery, behind thymus and left innominate veins.
5. Left lateral surface of thymus gland, thoracic portion.
6. Left phrenic nerve.
7. Parietal pericardium divided.
8. Left subclavian artery, ascending portion, covered by parietal pleura.
9. Left superior intercostal vein, covered by parietal pleura.
10. Openings at hilus of divided superior left pulmonary veins.

Between 10 and 11, and crossed by the fork at 10, are seen the openings of the divided apical branches of pulmonary artery.

11. Pulmonary artery, divided at hilus.
12, 13. Left bronchus (hyparterial) divided at hilus.
14. Inferior left pulmonary vein, divided at hilus.
15. Thoracic aorta covered by parietal pleura.
16. Left surface of œsophagus covered by parietal pleura.

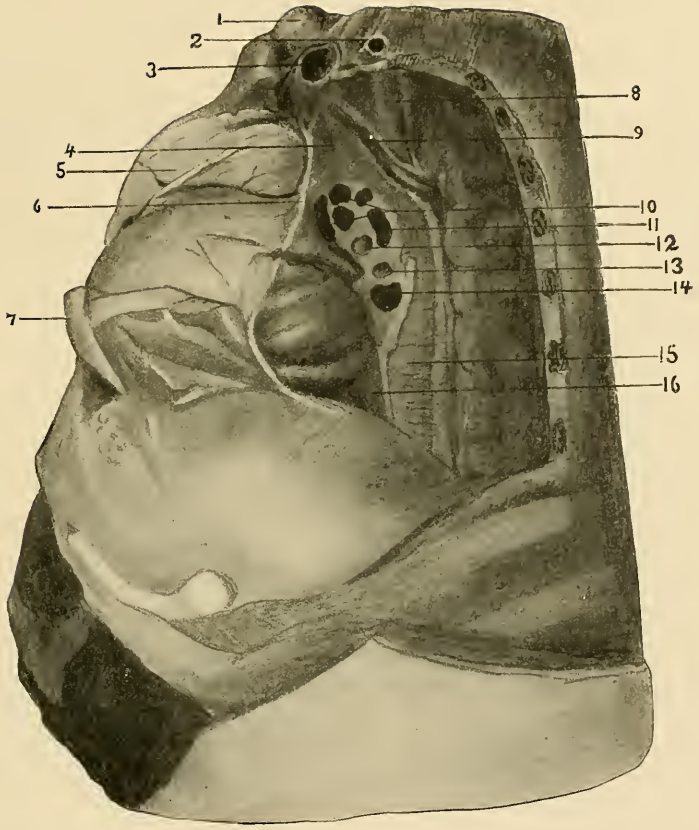


Fig. XXVI.

Fig. XXVII. Infant immediately after birth (*F*). Mediastinal contents, left lateral view; mediastinal parietal pleura partly reflected.

1. Left subclavian vein.
2. Left internal mammary artery.
3. Fatty connective tissue and small lymphatic glands behind left innominate vein and thymus.
4. Left lateral (pleural) surface of thymus gland, thoracic portion.
5. Left phrenic nerve.
6. Left subclavian artery.
7. Left deep cervical vein.
8. Left common carotid artery.
9. Left vagus.
10. Œsophagus.
11. Left superior intercostal vein.
12. Left pulmonary artery.
13. Superior left pulmonary vein.
14. Left bronchus (hyparterial) cut just beyond primary division.
15. Left inferior pulmonary vein.
16. Thoracic aorta, covered by 17, parietal pleura.
18. Œsophagus, covered by 17, parietal pleura.

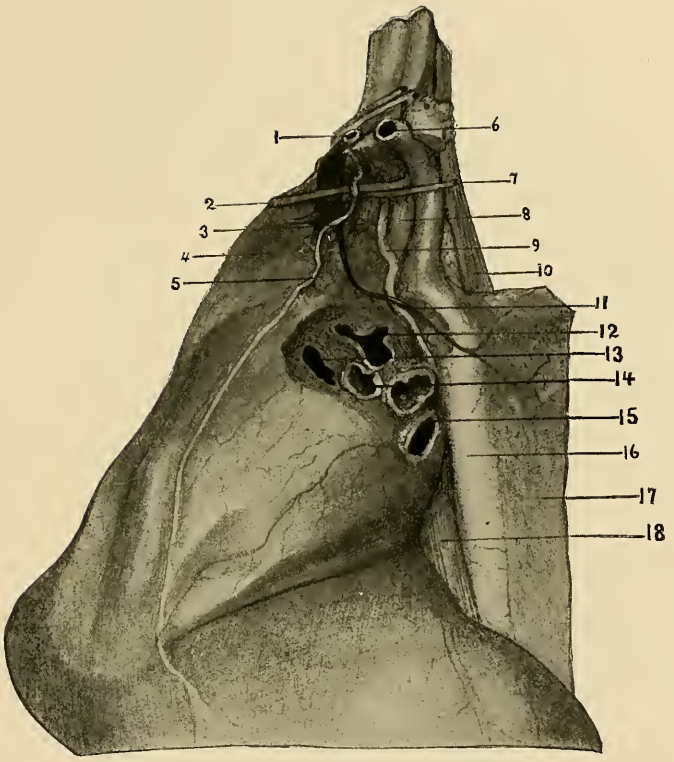


Fig. XXVII.

Fig. XXVIII. Fœtus at term (*E*). Mediastinal contents. Right lateral view. Parietal pleura in place.

1. Parietal pleura covering tracheal and superior œsophageal surfaces and right vagus.
2. Azygos vein at junction with right superior intercostal vein.
3. Right sympathetic nerve.
4. Right vagus, inferior œsophageal branches.
5. Right subclavian artery.
6. Right subclavian vein.
7. Left innominate vein.
8. Right phrenic nerve.
9. Right lateral (pleural) surface of thymus gland, thoracic portion.
10. Superior vena cava.
11. Apical branch, right pulmonary artery.
12. Right eparterial bronchus.
13. Apical branch of right pulmonary artery.
14. Main trunk of right pulmonary artery.
15. Right hyparterial bronchus.
16. Superior right pulmonary vein.
17, 18. Inferior right pulmonary vein.
19. Inferior vena cava, intrathoracic segment.

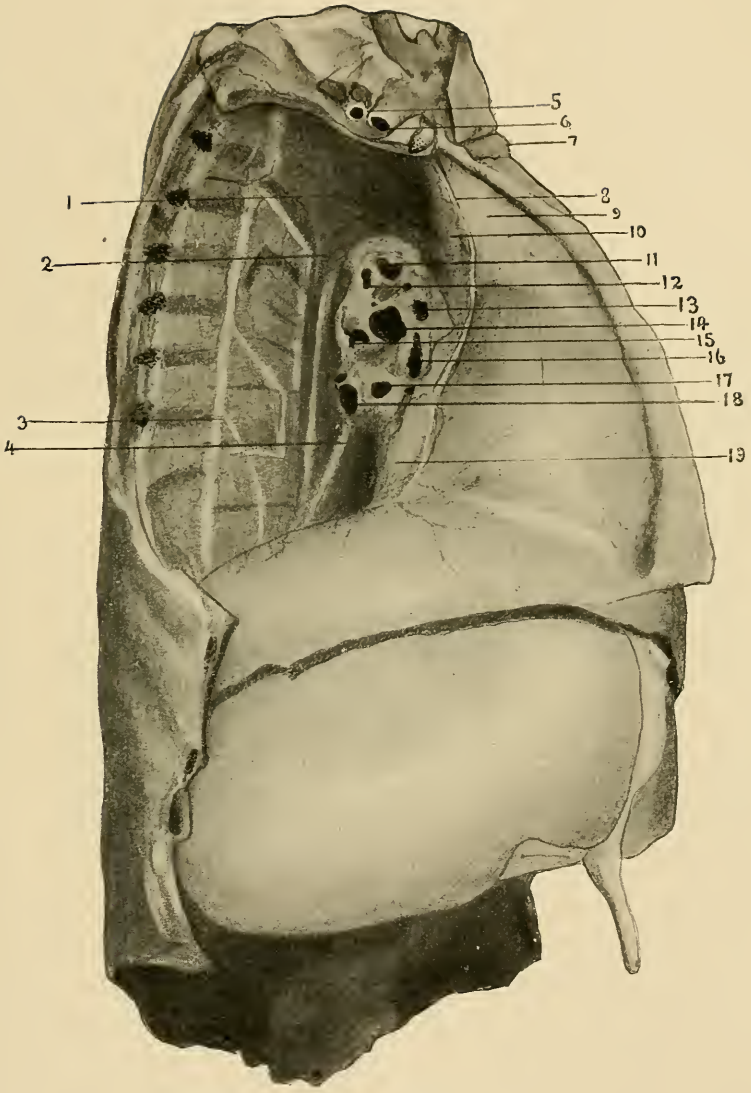


Fig. XXVIII.

Fig. XXIX. Fœtus at term (*D*). Mediastinal contents *in situ*. Right lateral view, upper part of mediastinal pleura reflected.

1. Vena azygos.
2. Right subclavian artery.
3. Right subclavian vein, cut at junction with right internal jugular.
4. Œsophagus.
5. Right vagus.
6. Trachea.
7. Fatty connective and lymphatic gland tissue between trachea and right innominate vein.
8. Right lateral surface of thymus gland, thoracic portion.
9, 10. Apical branches of right pulmonary artery.
11. Right bronchus, cut at division into eparterial and hyparterial trunks.
12. Right pulmonary artery.
13. Right superior pulmonary vein.
14. Right inferior pulmonary vein.

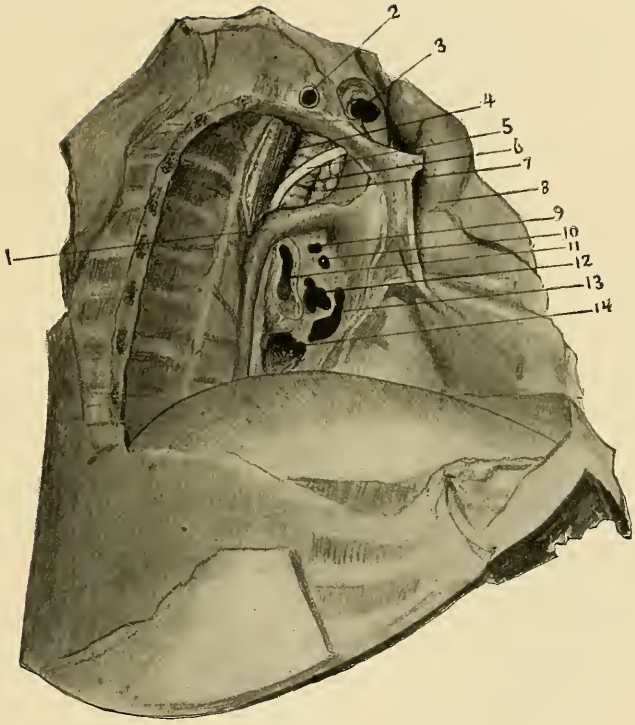


Fig. XXIX.

Fig. XXX. Infant, immediately after birth (*F*). Mediastinal contents, right lateral view, mediastinal parietal pleura reflected.

1. Œsophagus.
2. Right vertebral vein.
3. Trachea.
4. Azygos vein.
5. Left parietal pleura, costovertebral division.
6. Thoracic aorta.
7. Hemiazygos vein.
8. Right vertebral artery.
9. Right subclavian artery.
10. Right subclavian vein.
11. Scalenus anticus, cut.
12. Right internal mammary artery.
13. Peritracheal fatty connective and lymphatic tissue.
14. Right vagus.
15. Superior cava.
16. Right phrenic nerve.
17. Right eparterial bronchus.
18. 19. Apical branches right pulmonary artery.
20. Right hyparterial bronchus.
21. Right superior pulmonary vein.
22. Main trunk right pulmonary artery.
23. Right inferior pulmonary vein.
24. Inferior vena cava.

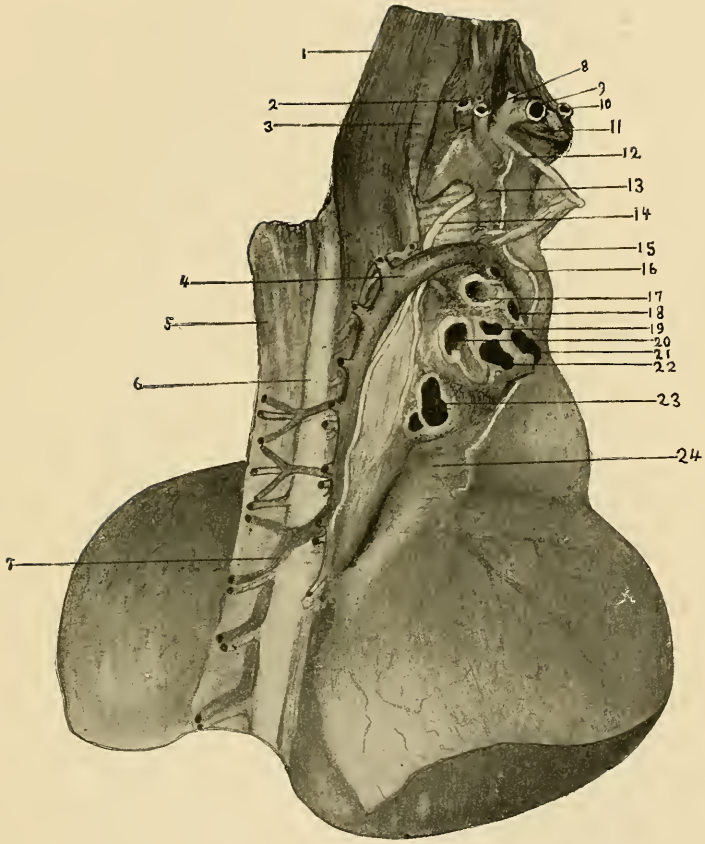


Fig. XXX.

Fig. XXXI. Fœtus at term (*E*). Anterior view of thoracic viscera.

1. Junction of right jugular and subclavian veins.
2. First rib, divided.
3. Right parietal pleura, anterior portion of sternocostal division.
4. Pericardium, portion uncovered by pleura and exposed between right and left mediastinal pleural reflections.
5. Left internal jugular vein.
6. Left external jugular vein.
7. Anterior surface thymus gland, cervical portion.
8. Left subclavian vein.
9. Left innominate vein.
10. Anterior surface thymus gland, thoracic portion.
11. Right mediastinal pleura, passing to lateral surface of thymus gland.

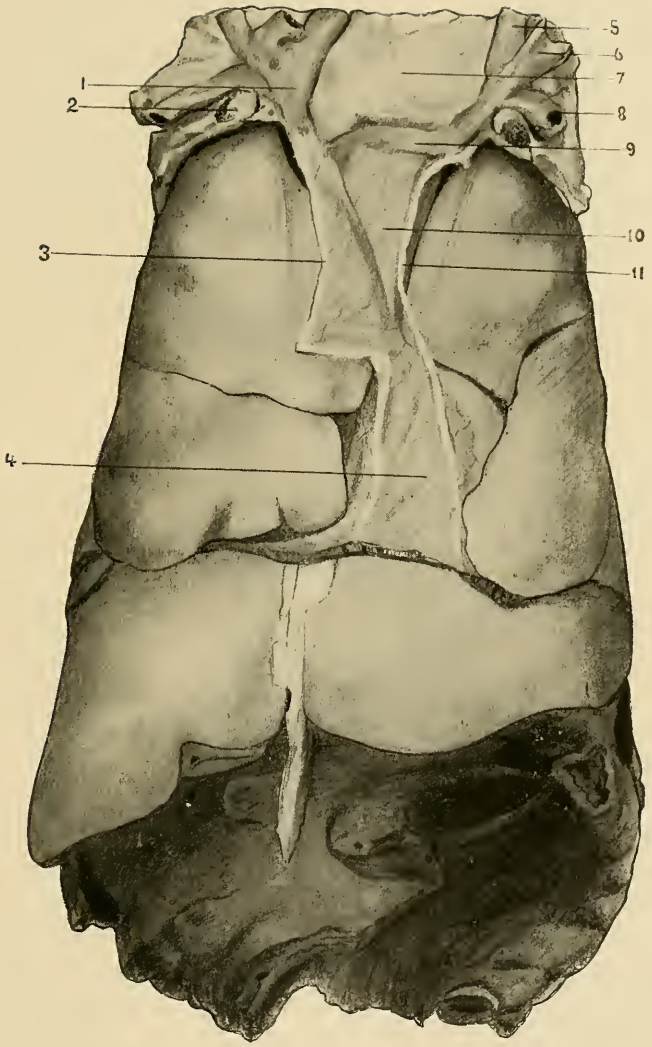


Fig. XXXI.

Fig. XXXII. Fœtus at term (*D*). Lungs and mediastinal contents, viewed from above.

1. Œsophagus.
2. Trachea.
3. Right subclavian artery.
4. Right innominate vein.
5. Right internal mammary artery.
6. Anterior surface right ventricle, parietal pericardium, cut.
7. Left common carotid artery.
8. Left innominate vein.
9. Left subclavian artery.
10. Superior retrovenous cornu of thymus gland.
11. Ascending aorta.
12. Pulmonary artery.
13. Pericardium, divided.
14. Right auricular appendix.
15. Superior prevenous cornu of thymus gland, cervical portion turned forward and downward.

Fig. XXXIII. Fœtus of fourth month (*H*). Anterior view of thoracic viscera.

1. Left innominate vein.

Fig. XXXIV. Schematic transection of thorax below level of pulmonary hilus, to show pleural reflection forming the broad pulmonary ligament (viewed from above).

1. Thoracic aorta.
2. Œsophagus.
3. Left broad ligament.
4. Pericardium.
5. Pericardial division of mediastinal pleura.
6. Pericardium.
7. Visceral pleura, mediastinal surface.
8. Parietal pleura, sternocostal division.
9. Inferior vena cava.
10. Right broad ligament.
11. Azygos vein.

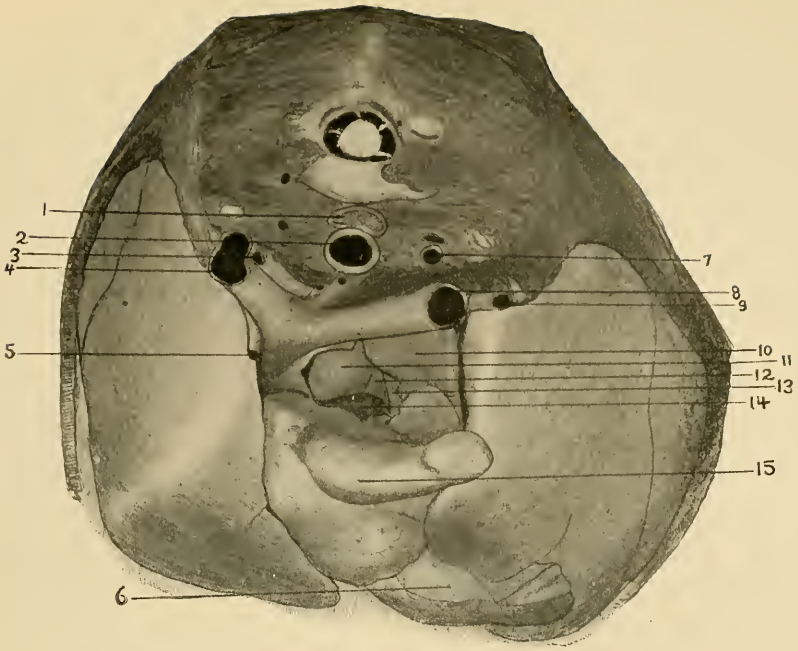


FIG. XXXII.

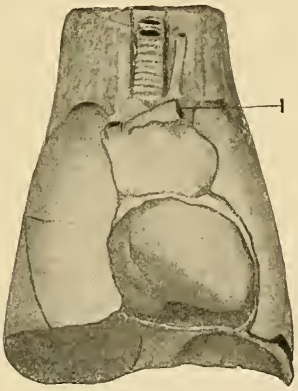


FIG. XXXIII.

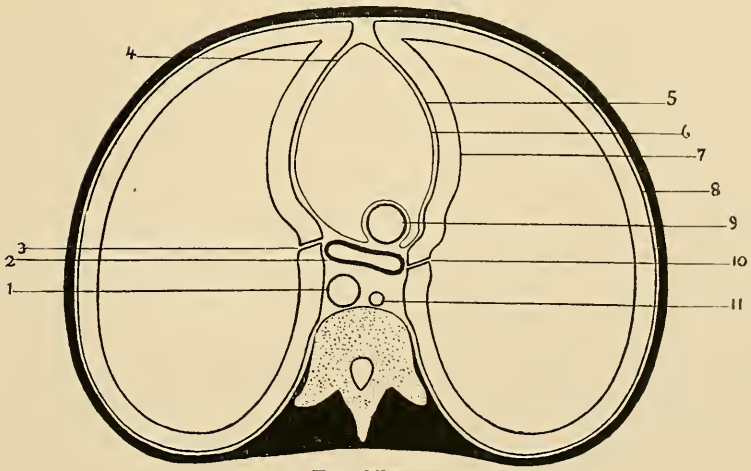


FIG. XXXIV.

4. Anterior marginal fissure.
5. Secondary fissure of cardiac incisure.

Figs. V and VI. Outline representations of the basal surfaces of the same lungs (*A*).

1. Sternocostal surface.
2. Anterior margin.
3. Mediastinal surface.
4. Internal margin.
5. Costovertebral surface.
6. Posterior margin.

Figs. VII to X. Right and left lungs of fœtus of 31 weeks (estimated) (*B*), medial and lateral surfaces.

1. Pulmonary attachment of broad ligament.
2. Posterior apical costal sulcus.
3. Anterior apical costal sulcus.
4. Anterior marginal fissure.

Figs. XI and XII. Outline representations of the basal surfaces of the same lungs (*B*).

1. Sterno-costal surface.
2. Anterior margin.
3. Mediastinal surface.
4. Internal margin.
5. Costovertebral surface.
6. Posterior margin.

Fig. XIII. Fœtus at term (*C*). Basal view of hardened lungs and heart removed together from thorax.

1. Portion of medial margin of phrenic surface in contact with right side of œsophagus.
2. Inferior vena cava.
3. Portion of diaphragm attached to inferior surface of pericardium.
4. Œsophageal tuberosity of left lower lobe, basal surface.
5. Portion of medial margin of phrenic surface in contact with left side of œsophagus.
6. Phrenic margin of aortal surface.

Fig. XIV. Fœtus at term (*D*). Left lung. Sternocostal surface.

Fig XV. Fœtus at term (*D*). Left lung. Mediastinal surface.

1. Pulmonary attachment of ligamentum latum.
2. Pericardio-œsophageal tuberosity.
3. Aortal groove.
4. Subclavian groove.
5. Presubclavian area.
6. Thymic surface.
7. Pericardial surface.
8. Pericardial surface of pericardio-œsophageal tuberosity.
9. Œsophageal surface of pericardio-œsophageal tuberosity.

Fig. XVI. Fœtus at term (*E*). Left lung. Sternocostal surface.

Fig. XVII. Fœtus at term (*E*). Mediastinal surface.

1. Pulmonary attachment of ligamentum latum.
2. Pericardio-œsophageal tuberosity.
3. Aortal groove.
4. Subclavian groove.
5. Presubclavian area.
6. Thymic surface.
7. Pericardial surface.
8. Pericardial surface of pericardio-œsophageal tuberosity.
9. Œsophageal surface of pericardio-œsophageal tuberosity.

Fig. XVIIa. Schematic figure, indicating relations of mediastinal surface of left lung.

Fig. XVIII. Fœtus at term (*D*). Anterior view of lungs and mediastinum *in situ*.

1. Anterior surface of thoracic portion of thymus gland.
2. Junction of right subclavian and internal jugular veins.
3. Right common carotid artery.
4. Inferior thyroid vein.
5. Superior prevenous cornu of thymus gland.
6. Left innominate vein.
7. Left subclavian artery.
8. Parietal pericardium divided by a cruciform incision.

Fig. XIX. Fœtus at term (*D*). Right lung. Sternocostal surface.

Fig. XX. Fœtus at term (*D*). Right lung. Mediastinal surface.

1. Inferior caval surface.
2. Pericardial surface.
3. Thymic surface.
4. Innominate and superior caval surface.
5. Tracheal and upper œsophageal surface.
6. Azygos groove.
7. Lower œsophageal surface.
8. Pulmonary attachment of ligamentum latum.

Fig. XXI. Fœtus at term (*E*). Right lung. Sternocostal surface.

Fig. XXII. Fœtus at term (*E*). Right lung. Mediastinal surface.

1. Inferior caval surface.
2. Pericardial surface.
3. Thymic surface.
4. Innominate and superior caval surface.
5. Tracheal and upper œsophageal surface.
6. Azygos groove.
7. Lower œsophageal surface.
8. Pulmonary attachment of ligamentum latum.

Fig. XXIIa. Schematic figure indicating relations of mediastinal surface of right lung.

Fig. XXIII. Infant, immediately after birth (*F*). Right lung. Mediastinal surface.

1. Inferior caval surface.
2. Pericardial surface.

3. Thymic surface.
4. Innominate and superior caval surface.
5. Tracheal and upper œsophageal surface.
6. Azygos groove.
7. Lower œsophageal surface.
8. Pulmonary attachment of ligamentum latum.

Fig. XXIV. Fœtus at term (*G*). Phrenic surface of right lung, with azygos fissure of lower lobe.

1. Azygos lobule.
2. Azygos fissure.

Fig. XXV. Fœtus at term (*D*). Phrenic surface of right lung, with azygos fissure of lower lobe.

1. Azygos fissure.

Fig. XXVI. Fœtus at term (*D*). Mediastinal contents, left lateral view, with parietal pleura in place.

1. Superior prevenous cornu of cervical portion of thymus gland.
2. Left subclavian artery, supracostal portion.
3. Left subclavian vein.
4. Parietal mediastinal presubclavian surface, covering fatty connective and lymphatic tissue overlying left common carotid artery, behind thymus and left innominate veins.
5. Left lateral surface of thymus gland, thoracic portion.
6. Left phrenic nerve.
7. Parietal pericardium divided.
8. Left subclavian artery, ascending portion, covered by parietal pleura.
9. Left superior intercostal vein, covered by parietal pleura.
10. Openings at hilus of divided superior left pulmonary veins.

Between 10 and 11, and crossed by the fork at 10, are seen the openings of the divided apical branches of pulmonary artery.

11. Pulmonary artery, divided at hilus.
12, 13. Left bronchus (hyparterial) divided at hilus.
14. Inferior left pulmonary vein, divided at hilus.
15. Thoracic aorta covered by parietal pleura.
16. Left surface of œsophagus covered by parietal pleura.

Fig. XXVII. Infant immediately after birth (*F*). Mediastinal contents, left lateral view; mediastinal parietal pleura partly reflected.

1. Left subclavian vein.
2. Left internal mammary artery.
3. Fatty connective tissue and small lymphatic glands behind left innominate vein and thymus.
4. Left lateral (pleural) surface of thymus gland, thoracic portion.
5. Left phrenic nerve.
6. Left subclavian artery.
7. Left deep cervical vein.
8. Left common carotid artery.
9. Left vagus.
10. Œsophagus.

11. Left superior intercostal vein.
12. Left pulmonary artery.
13. Superior left pulmonary vein.
14. Left bronchus (hyparterial) cut just beyond primary division.
15. Left inferior pulmonary vein.
16. Thoracic aorta, covered by 17, parietal pleura.
18. Œsophagus, covered by 17, parietal pleura.

Fig. XXVIII. Fœtus at term (*E*). Mediastinal contents. Right lateral view. Parietal pleura in place.

1. Parietal pleura covering tracheal and superior œsophageal surfaces and right vagus.
2. Azygos vein at junction with right superior intercostal vein.
3. Right sympathetic nerve.
4. Right vagus, inferior œsophageal branches.
5. Right subclavian artery.
6. Right subclavian vein.
7. Left innominate vein.
8. Right phrenic nerve.
9. Right lateral (pleural) surface of thymus gland, thoracic portion.
10. Superior vena cava.
11. Apical branch, right pulmonary artery.
12. Right eparterial bronchus.
13. Apical branch of right pulmonary artery.
14. Main trunk of right pulmonary artery.
15. Right hyparterial bronchus.
16. Superior right pulmonary vein.
17, 18. Inferior right pulmonary vein.
19. Inferior vena cava, intrathoracic segment.

Fig. XXIX. Fœtus at term (*D*). Mediastinal contents *in situ*. Right lateral view, upper part of mediastinal pleura reflected.

1. Vena azygos.
2. Right subclavian artery.
3. Right subclavian vein, cut at junction with right internal jugular.
4. Œsophagus.
5. Right vagus.
6. Trachea.
7. Fatty connective and lymphatic gland tissue between trachea and right innominate vein.
8. Right lateral surface of thymus gland, thoracic portion.
9, 10. Apical branches of right pulmonary artery.
11. Right bronchus, cut at division into eparterial and hyparterial trunks.
12. Right pulmonary artery.
13. Right superior pulmonary vein.
14. Right inferior pulmonary vein.

Fig. XXX. Infant, immediately after birth (*F*). Mediastinal contents, right lateral view, mediastinal parietal pleura reflected.

1. Œsophagus.
2. Right vertebral vein.
3. Trachea.
4. Ayzgos vein.
5. Left parietal pleura, costovertebral division.
6. Thoracic aorta.
7. Hemiazygos vein.
8. Right vertebral artery.
9. Right subclavian artery.
10. Right subclavian vein.
11. Scalenus anticus, cut.
12. Right internal mammary artery.
13. Peritracheal fatty connective and lymphatic tissue.
14. Right vagus.
15. Superior cava.
16. Right phrenic nerve.
17. Right eparterial bronchus.
18, 19. Apical branches right pulmonary artery.
20. Right hyparterial bronchus.
21. Right superior pulmonary vein.
22. Main trunk right pulmonary artery.
23. Right inferior pulmonary vein.
24. Inferior vena cava.

Fig. XXXI. Fœtus at term (*E*). Anterior view of thoracic viscera.

1. Junction of right jugular and subclavian veins.
2. First rib, divided.
3. Right parietal pleura, anterior portion of sternocostal division.
4. Pericardium, portion uncovered by pleura and exposed between right and left mediastinal pleural reflections.
5. Left internal jugular vein.
6. Left external jugular vein.
7. Anterior surface thymus gland, cervical portion.
8. Left subclavian vein.
9. Left innominate vein.
10. Anterior surface thymus gland, thoracic portion.
11. Right mediastinal pleura, passing to lateral surface of thymus gland.

Fig. XXXII. Fœtus at term (*D*). Lungs and mediastinal contents, viewed from above.

1. Œsophagus.
2. Trachea.
3. Right subclavian artery.
4. Right innominate vein.
5. Right internal mammary artery.
6. Anterior surface right ventricle, parietal pericardium, cut.
7. Left common carotid artery.
8. Left innominate vein.

9. Left subclavian artery.
10. Superior retrovenous cornu of thymus gland.
11. Ascending aorta.
12. Pulmonary artery.
13. Pericardium, divided.
14. Right auricular appendix.
15. Superior prevenous cornu of thymus gland, cervical portion turned forward and downward.

Fig. XXXIII. Fœtus of fourth month (*II*). Anterior view of thoracic viscera.

1. Left innominate vein.

Fig. XXXIV. Schematic transection of thorax below level of pulmonary hilus, to show pleural reflection forming the broad pulmonary ligament (viewed from above).

1. Thoracic aorta.
2. Œsophagus.
3. Left broad ligament.
4. Pericardium.
5. Pericardial division of mediastinal pleura.
6. Pericardium.
7. Visceral pleura, mediastinal surface.
8. Parietal pleura, sternocostal division.
9. Inferior vena cava.
10. Right broad ligament.
11. Azygos vein.

REPORT OF PATHOLOGIST.

By Farquhar Ferguson, M.D.

The following is a statement of the work done in the pathological department of the Hospital during the year ending January 1, 1897:

There have been only three autopsies on women dying after childbirth. In two of these the cause of death was due to septic peritonitis, and in each of these cases the streptococcus pyogenes was found in the uterus, in the Fallopian tubes, and in the purulent fluid in the peritoneum. The third case revealed a gastric ulcer and enormous abscesses in the liver, which were directly connected with the ulcer. The staphylococcus pyogenes aureus and albus were obtained in cultures made at the postmortem in this case.

Twenty autopsies were made on infants, most of them by Dr. Martha Wollstein, Assistant Curator. The majority of these were abortions and still-born, and as the remainder died shortly after birth, there was no notable lesion in any of the cases to account for death.

REPORT OF BACTERIOLOGIST.

By Martha Wollstein, M.D.

Bacteriological examinations of vaginal and uterine secretions have been made in twenty-four cases, of which four were full term, three premature, and seventeen abortions. Cultures in glycerine agar were taken from the upper part of the vagina and from the uterine cavity before operative interference, after operation, and, in some cases, at the end of the puerperium. The results are tabulated below.

I. Full Term.

C. N.	Uterus.		Vagina.	
	Before Operation.	After Operation.	Before Operation.	After Operation.
7,018	Staph. pyog. aureus	Staph. pyog. aureus	Tube broken when rec'd.	No culture taken.
7,808	" " "	" " albus.	Staph. pyog. alb.; staph. pyog. aur.	Staph. pyog. alb. " " aur.
9,959	" " alb..	Sterile	No culture taken..	No culture.
738	No culture taken..	"	" " " ..	Staph. aureus.

In C. N. 7,018, cultures from the pus of an abscess over the left deltoid region showed a growth of staphylococcus aureus and streptococcus pyogenes longus.

It is interesting to note that cases 7,018 and 7,808 ran a febrile temperature, while 9,959 did not; and in 738 the fever was attributed to another cause than uterine infection.

II. Premature.

C. N.	Uterus.		Vagina.	
	Before Operation.	After Operation.	Before Operation.	After Operation.
6,880	Sterile	No culture taken..	.....	No culture taken.
7,167	"	Sterile	Staph. pyog. alb.; bacillus coli com.	Staph. pyog. albus.
51	"	"	No culture taken..	No culture taken.

A Petri dish containing agar was exposed to the air in the room of patient No. 7,167 for forty-eight minutes; the following micro-organisms developed colonies: sarcina aurantica, staphylococcus pyogenes albus, bacillus subtilis, bacillus fluorescens liquefaciens, and aspergillus niger.

III. Abortions.

C. N.	Uterus.		Vagina.	
	Before Operation.	After Operation.	Before Operation.	After Operation.
6,909	Sterile	Sterile	Staph. pyog. albus	Sterile.
6,891	"	"	Bacillus coli com. Bacillus fluor. non-liq.	No culture taken.
7,022	"	"	Sterile	Sterile.
7,029	"	"	Strepto. brevis. Diplococcus subflavus of Bumm.	No culture taken.
7,117	"	No culture taken	Diplococcus albicans of Bumm.	" " "
7,177	"	Sterile	Broken when rec'd	Sterile.
7,211	"	"	Red yeast	No culture taken.
7,465	"	"	Bacillus coli com. Staph. pyog. aureus.	Sterile.
7,683	"	"	Sterile	"
8,086	"	No culture taken	Bacillus coli com.	No culture taken.
8,077	"	Sterile	Staph. pyog. albus.	Staph. pyog. albus.
8,087	"	No culture taken	Staph. pyog. albus.	No culture taken.
6,880	"	" " "	No culture taken	" " "
6,855	No culture taken	*At end of puerp.:* sterile.	" " "	*At end of puerp.:* staph. pyog. alb.
6,915	" " "	No culture taken	" " "	*At end of puerp.:* staph. pyog. alb.
6,924	Sterile	Sterile	Tube broken	Sterile.
7,034	"	"	Staph. albus. Bacillus coli communis.	Bacillus coli com.

Petri plate (agar) exposed to the air for one hour in the room of patient 7,211 developed colonies of sarcina lutea, staphylococcus albus, bacillus subtilis, bacillus fluorescens liquefaciens, red yeast, and penicillium glaucum.

Surgical dressings have been examined on three occasions. The method employed was the same throughout: pieces were snipped off from various portions of each article by means of scissors and forceps sterilized by dry heat, and the pieces dropped into sets of bouillon, agar, and gelatine tubes. The bouillon and agar tubes were placed in the thermostat and examined at the end of twenty-four hours. If sterile, the tubes were examined daily for ten to fourteen days. The gelatine tubes were kept at the room temperature.

I. *March* 14, 1895.

Cotton wipes in tins,
Vulva pads in tins,
Soft catheter in 5 per cent. carbolic acid,
Sterilized gauze in Kelly tube,
Iodoform gauze in Kelly tube,
Starch powder in glass bottle,
} No growth on agar, gelatine, or bouillon.

Tape (for cord) in glass—growth of bacillus coli communis.

Dry wipes in glass bottle—growth of staphylococcus pyogenes albus.

Eye wipes in boracic acid—growth of an unidentified bacillus, non-pathogenic.

II. *March* 30, 1896.

Dry wipes in glass bottle—growth of bacillus subtilis and staphylococcus albus.

Cord tape in glass—growth of saccharomyces and staphylococcus albus.

Nail brush—sterile.

The result of the culture from the nail brush was sufficiently surprising to warrant a second experiment.

A well-used brush was taken from labor bag No. 18, which was on the shelf ready for service. With a pair of sterilized scissors a number of bristles were cut off and dropped into some bouillon, agar, and gelatine tubes, the brush being held directly over the mouth of the tubes. A second set of tubes were inoculated with scrapings made with a stiff platinum needle all over the wood of the brush, between the bristles. No growth of any kind appeared in any one of the twelve tubes inoculated.

The conclusion is obvious, then, that such a brush in daily use becomes sufficiently saturated with the bichloride of mercury solution used in scrubbing the hands as to hold no viable bacteria upon or between its bristles. Less than twenty-four hours had elapsed between the use of the brush and the making of the cultures.

III. *September* 11, 1896.

All the contents of labor bag No. 5 (ready for use) were tested:

Glass catheter, in glass tube, prepared by steaming half an hour, at 240 degrees Fahrenheit—no growth.

Intrauterine tube, in glass tube, prepared by steaming half an hour, at 240 degrees Fahrenheit—no growth.

Nail brush—no growth.

Vulva pad, in tin, steamed half an hour—no growth.

Cotton, in tin, steamed half an hour—no growth.

Solution of silver nitrate (1 per cent.)—no growth.

Eye dropper, carried free in loop on under surface of cover of bag—staphylococcus aureus.

Eye wipes, in saturated boracic solution—bacillus coli communis; penicillium glaucum.

Dry wipes, in bottle, not steamed—staphylococcus cereus flavus.

Cord tapes, not steamed—bacillus coli communis.

Starch, powdered, in bottle—bacillus megaterium.

Rubber pad (Kelly), scrubbed and carbolized—bacillus coli communis; staphylococcus aureus.

Cultures were made from the *hands* of four internes who had prepared themselves in the usual way (scrubbing with green soap, bichloride, and rinsing with distilled water) for the examination of a patient. Scrapings were taken from underneath and about the nails.

No.	Right Hand.	Left Hand.
1	Staphylococcus pyogenes albus ...	Staphylococcus pyogenes albus.
2	Sterile.....	" cereus flavus.
3	Staphylococcus pyogenes albus. " " citreus.	" pyogenes albus.
4	Staphylococcus pyogenes albus ; penicillium glaucum.	" " "

Eyes of babies with purulent conjunctivitis were examined by cultures and cover slips in four cases:

Gonococci were found in two, C. N. 13 and 716.

Staphylococci (aureus) found in one, C. N. 223.

Pseudo-diphtheria bacillus found in one, C. N. 721.

Throat cultures were taken from two cases:

Staphylococcus pyogenes aureus and streptococcus pyogenes; no Klebs-Löffler bacilli in either C. N. 10,518 or C. N. 738.

Sputum from C. N. 225 was found negative for tubercle bacilli.

Pus from abscess on hip of baby (A. N. 14,605) negative for tubercle bacilli; cultures show a growth of staphylococci and streptococci.

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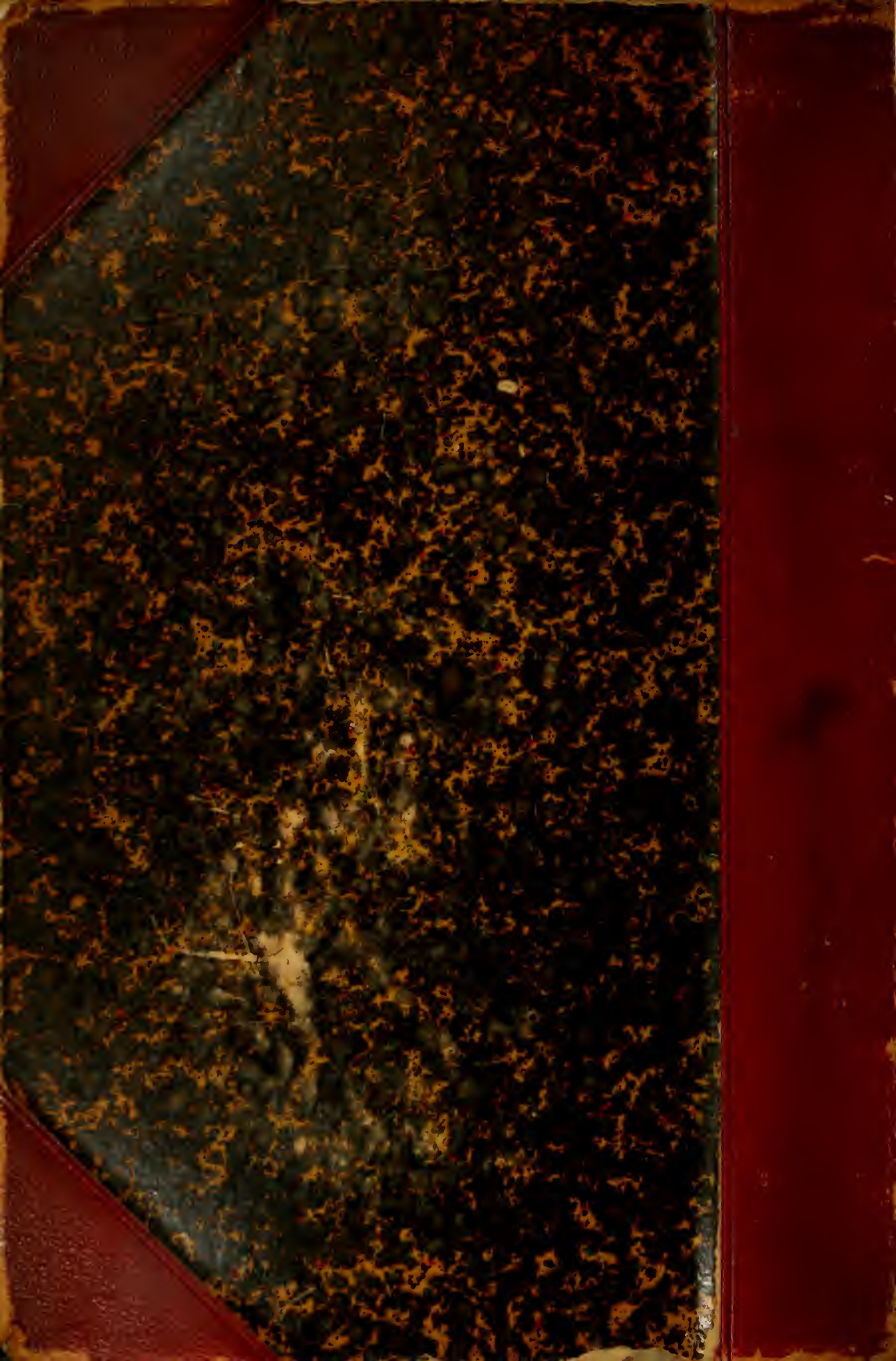
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